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Mr. F. Bond..... *Agrotis saucia*, six specimens; *Heliophobus hispida*, four specimens.
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Mr. J. J. Reading.... *Carabus intricatus*, two specimens.
Mr. A. F. Sealy .... *Laverna phragmitella*, four specimens.

ERRATA.

TRANSACTIONS.

Page 13, line 32 from top, after "*Cylindripomus nigro-fasciatus*," for "*Bois.*," read "*Bl.*"
„ 14 „ 1 „ for "*Coptocycla*," read "*Aspidomorpha.*"
„ 16 „ 27 „ for "*Caragenia*," read "*Ceragenia.*"
„ 255 „ 8 „ for "*Lamicidæ*," read "*Lamiadæ.*"
„ „ „ 20 „ for "*Amatella*," read "*Ametalla.*"

JOURNAL OF PROCEEDINGS.

Page 52, last line, for "£57 : 10*s.* 9*d.*," read "£37 : 10*s.* 9*d.*"
„ 62, line 16 from bottom, for "*Abracus*," read "*Abræus.*"
„ 73, dele the *first seven lines.*
„ „ line 3 from bottom, for "*Anomœsia*," read "*Anomœsia.*"
„ 76 „ 9 „ for "*Ancylophorus*," read "*Acylophorus.*"
„ „ „ 4 from top, for "*workers producing*," read "*worker-producing.*"
„ 84 „ 23 „ for "*Neurophora*," read "*Nemophora.*"
„ 87 „ 11 „ dele "(*E. S.*)"
„ 88 „ 21 „ for "*Ligustica*," read "*Liguria.*"
„ „ „ 4 from bottom, for "*Bastrichidæ*," read "*Bostrichidæ.*"
„ 118 „ 33 from top, for "*Chryphagus*," read "*Crypturgus.*"
„ 126 „ 9 from bottom, for "*Ligustica*," read "*Liguria.*"
„ 133 „ 25 „ for "*being a distinct species*," read "*being distinct species.*"
„ 138 „ 14 from top, for "*Platyderus*," read "*Plegaderus.*"

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BY-LAWS

OF THE

ENTOMOLOGICAL SOCIETY

OF LONDON,

ALTERED AND ADOPTED AT A SPECIAL MEETING
HELD ON THE 5TH NOVEMBER, 1855.

CHAP. I. *Object.*

THE ENTOMOLOGICAL SOCIETY OF LONDON is instituted for the improvement and diffusion of Entomological Science.

CHAP. II. *Constitution.*

The Society consists of British and Foreign Ordinary Members and Subscribers, the number of whom shall be unlimited; of Foreign Honorary Members, whose number shall not exceed ten; and of Foreign Corresponding Members, the number of whom shall be unlimited.

CHAP. III. *Management.*

The affairs of the Society shall be conducted by a Council, consisting of thirteen Members, to be chosen annually (five of whom shall form a quorum), four of whom shall not be re-eligible for the following year.

CHAP. IV. *Officers.*

The Officers of the Society shall consist of a President; three Vice-Presidents; a Treasurer; two Secretaries; and a Curator.

CHAP. V. *Annual Election of Officers.*

1. The President, Treasurer and Secretaries shall be elected annually out of the Council. The Vice-Presidents shall be nominated by the President, at the Meeting next after the Anniversary

Meeting, from the Council. The President and two of the Vice-Presidents shall not, however, remain in office more than two years successively. The Curator shall be appointed by the Council.

2. In the event of any vacancy occurring in the Council or Officers of the Society, at the next Meeting of Council after such vacancy has been made known, the Council shall recommend to the Society the name of some Member to be elected to the vacant situation; and the next Ordinary Meeting of the Society shall be made a Special General Meeting and the Members summoned accordingly, and the Election shall take place as provided for at the Anniversary Meeting, Chap. XX.

Chap. VI. *President.*

The duty of the President shall be to preside at the Meetings of the Society and Council, and regulate all the discussions therein, and to execute, or see to the execution of, the By-Laws and orders of the Society.

Chap. VII. *Vice-Presidents.*

1. In case of the absence of the President, it shall be the duty of a Vice-President to fill his place, or, in the absence of all the Vice-Presidents, a Member of the Council shall preside.

2. If no Member of the Council shall be present at any Ordinary Meeting, the Members present shall nominate and appoint by a majority to be Chairman, such Member as they shall deem fit.

3. The Chairman so appointed shall for the time being have all the authority, privilege and power of President.

Chap. VIII. *Treasurer.*

1. It shall be the duty of the Treasurer to receive for the use of the Society all sums of money payable to the Society, and to disburse all sums payable by the Society out of the funds in his hands.

2. No payment exceeding £5, excepting for rent or taxes, shall be made by the Treasurer without the consent of the Council.

3. The Treasurer shall keep a book of Cheque Receipts for admission fees and annual payments; each Receipt shall be signed by himself, the date of payment and name of Member or Subscriber paying being written both on the receipt and on the part of the cheque which is left in the book.

4. The Treasurer shall demand all arrears of annual payment, after such payment shall have been due three months.

5. The Treasurer shall, moreover, furnish the Auditors with a detailed account of all receipts and disbursements up to the 31st December, previous to each Anniversary. The accounts of the Treasurer shall be audited annually previously to the Anniversary Meeting by a Committee of three Members of Council, and three Members of the Society, to be appointed by the President at the Ordinary first Meeting in January, of which Committee three shall be a quorum.

Chap. IX. *Secretaries.*

1. It shall be the duty of the Secretaries to keep a list of all the Members, Subscribers, and Associates of the Society, together with their addresses; to produce to the Council all correspondence in any way connected with the Society at the next Meeting after such correspondence shall have been received, or taken place; to edit the Transactions and Proceedings under the direction of the Council, and to take care that the Proceedings are published and ready for delivery to the Members and Subscribers at a Meeting of the Society within six months after the entry of such Proceedings in the Minute Book has been confirmed.

2. Minutes of the Proceedings of Monthly and Council Meetings shall be taken by one of the Secretaries; or, in their absence, by any Member whom the Chairman may appoint for the occasion.

3. The Minutes shall be fairly copied by one of the Secretaries into a Minute Book, and at the next Meeting read aloud for confirmation.

Chap. X. *Curator.*

It shall be the duty of the Curator to take care of the Library and Cabinets of the Society; * to arrange and class the insects, &c.; to keep a Catalogue of the Library; and to call in all books borrowed, as directed in Sect. 5, Chap. XI.

Chap. XI. *Library and Cabinet Regulations.*

1. A Catalogue of the Library and MSS. shall be kept by the Curator, with the names of the Donors.

* The Curator is in attendance at the Rooms of the Society every Monday between the hours of Two and Seven o'clock, P.M., for the purpose of showing the Collections, &c. to Members and Subscribers.

2. The Library and Cabinets shall be under the superintendence of a Committee, consisting of the President and four Members, who shall be elected by the Council at the first Meeting in February in every year (three of whom shall be a quorum), and who shall render an Annual Report to the Council at the first Meeting in the following January.

3. No Member or Subscriber shall, without special permission of the Council, be allowed to borrow or have in his possession from the Library more than four volumes at one time, or to retain the same longer than one month, without leave of the Curator.

4. If the books are torn, injured, lost, or not forthcoming when demanded by the Curator, full compensation shall be made for the same by the borrower.

5. The Curator shall call in all books borrowed from the Library on the 5th day of January and 5th of July in every year; and in case the same be not returned on or before the General Meeting of the Society in the following month, notice thereof shall be given by him to the Council, who shall then direct a second notice to be sent to the Member or Subscriber retaining such books, and in case the same be not returned within the further space of four weeks from the date of such second notice so sent, such Member or Subscriber shall in future be disqualified from borrowing books from the Library without the special permission of the Council.

6. All Members of and Subscribers to the Society shall have free access to the Library and Cabinets, at the time specified in the By-Laws, for the purpose of examination and description, and shall be allowed, with the permission of the Council, to borrow specimens from the collections for such purposes; excepting that if a Member, Subscriber or Stranger present specimens of new insects to the Society with manuscript names attached, specifying his intention of publishing the same, then no individual, whether Member, Subscriber or Stranger, shall during the space of twelve months publish any description or figure of such specimen.

7. No Stranger shall be allowed to see the Library or Cabinets unless introduced by a Member or Subscriber; but a note addressed to the Curator or Secretary shall be deemed a sufficient introduction.

8. No Stranger shall be permitted to take away or to describe any insect, or to make a drawing of the same, except by special permission of the Council previously obtained.

Chap. XII. *Election and Admission of Members and Subscribers.*

1. Every Candidate for admission into the Society shall be proposed by three or more Members, who must sign a Certificate in recommendation of him.

2. The Certificate shall specify the name, and usual place of residence of the Candidate.

3. The Certificate for a Member, having been read at one of the Ordinary Meetings, shall be suspended in the room, read again at the following Ordinary Meeting, and the person therein recommended shall be balloted for at the next Ordinary Meeting.

4. The Certificate for a Subscriber, having been read at one of the Ordinary Meetings, shall be suspended in the Room, and the person therein recommended shall be balloted for at the next Ordinary Meeting after such reading.

5. The method of voting for the election of Members and Subscribers shall be by Ballot, and two-thirds of the Members balloting shall elect.

6. The Elections of Ordinary Members shall be void unless the admission fee shall be paid within twelve months after the date of their Election; the Council shall, however, possess a discretionary power to extend the time of payment.

7. Members and Subscribers shall sign the Obligation Book of the Society at the first Ordinary Meeting of the Society at which they are present, and shall then be admitted by the President.

Chap. XIII. *Admission Fee and Annual Contribution.*

1. The Admission Fee for Members shall be £2 : 2*s*, the Annual Contribution £1 : 1*s*.

2. The Annual Contribution for Subscribers is £1 : 1*s*., without Admission Fee.

3. The composition in lieu of the Annual Contribution is £15 : 15*s*.; the composition for Members and Subscribers elected previous to the 1st January, 1852, is £10 : 10*s*.

4. The Annual Contribution shall become due on the first day of January in every year in advance; but any Member or Subscriber elected after the 30th of September will not be called upon for his subscription for the remaining portion of that year.

Chap. XIV. *Withdrawing and Removal of Members and Subscribers.*

1. Every Member or Subscriber, having paid all fees due to the Society, shall be at liberty to withdraw therefrom upon giving notice in writing to the Secretary.

2. Whenever written notice of a motion shall be delivered to the Secretary for removing any Member, or Subscriber, signed by the Chairman for the time being on the part of the Council or by five or more Members, such notice shall be read from the chair at the two Ordinary General Meetings immediately following the delivery thereof, and the next following Ordinary Meeting shall be made a Special General Meeting and the Members summoned accordingly, when such motion shall be taken into consideration and decided by ballot; whereat if a majority of the Members balloting shall vote that such Member or Subscriber be removed, he shall be removed from the Society.

3. Whenever any Ordinary Member of the Society shall be in arrear for three years in the payment of his Annual Contribution, notice thereof in writing shall be given or sent to him by the Treasurer, together with a copy of this section; and in case the same shall still remain unpaid, the Treasurer shall give notice thereof to the Council, who shall cause the name of such Member, together with a statement of the sum due by him for arrears, to be read at the three following Ordinary Meetings of the Society, after the last of which a second similar notice shall be sent to him, and at the fourth Ordinary Meeting such Member of the Society shall be removed, and the President shall erase his name from the List of Members.

4. Whenever the Annual Contribution of a Subscriber shall be in arrear one year, such Subscriber shall have his name erased from the List of Subscribers and cease to belong to the Society.

Chap. XV. *Privileges of Members and Subscribers.*

1. The Members have the right to be present, to state their opinion and to vote at all Meetings; to propose Candidates for admission into the Society; to introduce Visitors at general Meetings of the Society; and to introduce scientific Strangers to the Library and Museum: to purchase the Transactions of the Society at reduced prices, and to have personal access to the Library and Museum.

2. No Member to introduce more than one Visitor.

3. Ordinary Members of the Society resident more than fifteen miles from London shall be entitled to receive the Transactions gratuitously when their Annual Contribution has been paid.

4. All the Honorary and Ordinary Members are eligible to any office in the Society, the latter provided they are not more than one year in arrear in the payment of the Annual Subscription.

5. No Member shall be entitled to vote on any occasion until he shall have paid his subscription for the year last past.

6. Subscribers enjoy all the privileges of Members excepting those of voting at the Meetings, holding office in the Society, and proposing Candidates.

7. Subscribers have no claim upon or interest in the property of the Society.

Chap. XVI. *Foreign Members.*

1. Every Foreigner who has distinguished himself as an Entomologist, or who has shown himself able and willing to promote the ends for which the Society is founded, may be elected a Foreign Member; his Annual Contribution shall be £1 : 1*s.*, and he shall be entitled to the same privileges as other Members.

2. Foreign Members shall not be required to sign the Obligation Book until present at an Ordinary Meeting of the Society, and when so present shall be admitted as other Members.

3. Foreign Members shall be exempt from the payment of any Admission Fee.

4. Foreigners and Residents abroad may be elected as *Corresponding Members*, who shall not be subject to the payment of any Annual Contribution, and who shall be entitled to a copy of the Journal of Proceedings of the Society, but not to the Transactions; which, however, may be purchased by them at the reduced price paid by the Ordinary Resident Members. The Privileges of Corresponding Members shall however cease in case they shall at any future time be residents in the United Kingdom for the space of twelve months, unless sanctioned, in the case of any particular Member, by a special vote of the Council.

Chap. XVII. *Honorary Members.*

1. Every person proposed as an Honorary Member shall be recommended by the Council, and be balloted for, and elected, and be liable to be removed in the like form and manner, and be subject to the same rules and restrictions, as an Ordinary Member.

2. Honorary Members shall be exempted from the payment of Fees and Contributions; and shall possess all the privileges of Ordinary Members.

3. No resident in Great Britain can be an Honorary Member, except William Spence, Esq., F.R.S.

Chap. XVIII. *Meetings of the Society.*

1. The Ordinary General Meetings of the Society shall be held on the first Monday in each month in the year, beginning at eight o'clock precisely in the evening, or at such other time as the Council shall direct.

2. At the Ordinary Meetings the order of business shall be as follows.

1. The names of the Visitors allowed to be present at the Meeting shall be read aloud by the Chairman.
2. The Minutes of the last Meeting shall be read aloud by one of the Secretaries, and proposed for confirmation by the Meeting, and signed by the Chairman.
3. The Presents made to the Society since their last Meeting shall be announced and exhibited.
4. Certificates in favour of Candidates for admission into the Society shall be read or submitted to ballot.
5. Members and subscribers shall sign their names in the Obligation Book, and be admitted.
6. Exhibitions of specimens, &c. shall be made.
7. Entomological communications shall be announced and read either by the Author or one of the Secretaries. When the other business has been completed, the persons present shall be invited by the Chairman to make their observations on the communications which have been read, and on the specimens or drawings which have been exhibited at the Meeting.

3. The President shall have a discretionary power as to the Papers to be read at the Meetings of the Society; and the Secretaries, assisted by the President and any Member or Members of the Council, shall determine as to the priority in which such papers shall be read, and propriety of omitting any portion of the same.

4. All Memoirs which shall be read at any General Meeting of the Society shall become the property of the Society, unless otherwise stipulated for previous to the reading thereof.

5. No Motion relating to the government of the Society, its By-Laws, the management of its concerns, or the election, appointment or removal of its Officers, shall be made at any Ordinary Meeting.

Chap. XIX. *Special General Meeting.*

Upon the requisition of any six or more Members, presented to the President and Council, a Special General Meeting of the Society shall be convened, and any proposition to be submitted to such Meeting shall be stated at length in the Notice to Members.

Chap. XX. *Annual General Meeting.*

1. The Annual General Meeting of the Society shall be held in the Meeting-room on the fourth Monday in January of every year.

2. The objects of the Meeting shall be to choose the Council and Officers for the then ensuing year; and to receive from the Council, and hear read, their Annual Report on the general concerns of the Society.

3. The Council for the time being shall annually cause to be prepared two written Lists, one of which (No. 1 in the Schedule hereto) shall contain the names of four Members, whom they shall recommend to be removed from, and of four other Members to be elected into the Council; and the other List (No. 2) shall contain the names of such Members as they shall recommend to fill the offices of President, Treasurer and Secretaries, for the year ensuing; which Lists shall be read at the Monthly Meeting in January, and shall then be fixed up in the Meeting-room until the day of election. And copies of such Lists shall be transmitted to every Member whose known residence shall be in London, or within twenty miles thereof, at least seven days before the Annual General Meeting shall take place.

4. The Secretaries, assisted by the Treasurer, shall prepare a List of the Members entitled to vote, and each Member voting shall give his name to the Scrutineers to be marked on the said List.

5. On the day of voting, each Member present shall put his balloting Lists into the respective Glasses to be provided for such occasion; before doing which, however, in case he shall have added any name or names to the Lists proposed by the Council, he shall strike out the name or names of those persons recommended for whom he does not vote. And if more names shall be suffered to

remain in any List than the number of persons to be elected or removed, such List shall be rejected. And in case the names suffered to remain shall be less than the number of vacancies to be supplied, those names only which shall remain in the List shall stand as voted for.

6. The President shall appoint two or more Scrutineers from the Members present, not being Members of the Council, to superintend the Ballots and report the results to the Meeting.

7. The Ballot for the Council shall remain open for one quarter of an hour, at the least; and the Ballot for the Officers for one quarter of an hour, at the least, after the result of the Ballot for the Council shall have been declared.

8. If from any cause an election shall not take place of persons to fill the Council, or any of the offices aforesaid, then the election of the Council and Officers, or the election of Officers, as the case may be, shall be adjourned until the next convenient day, of which notice shall be given, in like manner as is directed for the Annual General Meeting.

9. No Ballot, either for the election of Members or any other business, shall be taken unless nine Members are present.

Chap. XXI. *Transactions.*

1. The Transactions shall consist of Papers communicated to the Meetings of the Society.

2. The Transactions shall be published quarterly, and at such prices as the Council shall direct for each Part or Volume; but the price for one copy of each Part or Volume, to each Member or Subscriber who shall have paid his Annual Contribution for the year in which such Part or Volume shall be published, shall not exceed three-fourths of the price charged to the public.

3. Foreign Members of the Society who shall have paid the Annual Subscription for the year, and Ordinary English Members and Subscribers resident more than fifteen miles from London, shall be entitled to receive the Transactions of the Society published during the year without any further payment.

4. The superintendence of the Publications shall be by a Committee, which shall consist of thirteen Members to be appointed by the Council, including the President, Vice-Presidents, Treasurer, and Secretaries.

5. The Committee of Publication shall consider every Paper which shall have been communicated to a General Meeting of the Society, and shall report to the Council thereon; but no Paper shall be reported on at any Meeting of the Committee unless there shall be three or more Members present: and such Committee shall be convened by the Secretary every third month or oftener, when all papers read since the last Meeting of Committee shall be produced and referred.

6. Authors of Memoirs to be published in the Transactions shall be allowed 25 copies of their communications with uncoloured plates, gratis. If any additional number be required, the entire expense thereof and the colouring of all plates to be paid for by the Authors.

7. A Journal of Proceedings of the Society shall also be published quarterly or half-yearly, containing Abstracts of the Papers read and Notices of other Matters communicated at the Ordinary Meetings of the Society, which Journal, together with the Transactions, shall be edited by the Secretaries, or one of them, and shall be bound up and sold with the Transactions.

Chap. XXII. *Alteration of the By-Laws.*

Any of the By-Laws of the Society may at any time be repealed, or altered and amended, or others adopted in lieu thereof, at any Meeting of the Society, to be specially summoned in pursuance of Notice to be given to the President and Council, to be signed by six Members at least, such Notice to specify the intended repeal or alteration, and to be read at three General Meetings of the Society previous to such Special Meeting.

THE SCHEDULES REFERRED TO IN CHAPTER XX. OF THE PRECEDING BY-LAWS.

No. 1.

Form of the List for the Council.

List of Four Members of the present Council recommended by the present Council to be removed at the Election on the day of January, 18 .*

A. B.	
C. D.	
E. F.	
G. H.	

List of Four Members recommended to be elected into the Council.

I. K.	
L. M.	
N. O.	
P. Q.	

No. 2.

Form of the List for the Officers.

List of Persons recommended by the present Council to be appointed to the offices of President, Treasurer, and Secretaries of the Society, at the Election on the day of January, 18 .*

President . . . . . R. S.	
Treasurer. . . . . T. U.	
Secretaries . . . . . W. X. Y. Z.	

* If any of the Names in these Lists be objected to, they must be struck out previous to the Ballot, and other Names substituted in the blank spaces left for that purpose.

London: printed by C. Roworth & Sons, Bell Yard, Temple Bar.

TRANSACTIONS

OF THE

ENTOMOLOGICAL SOCIETY

OF

LONDON.

I. *Notes on South American Butterflies.* *By* H. W. Bates, Esq., Cor. Memb. Ent. Soc., London.

[Read September 7th, 1857.]

The following notes were communicated by Mr. Bates in a letter to Mr. Adam White, dated Ega, 20th May, 1857; and being the record of observations made on the insects in their native haunts, it is thought that they will not be devoid of interest to the Entomological Society :—

Papilio Caudius is the ♀ of *Papilio Torquatus*. It appears scarcely credible, but I once found a pair *in cop.* *Caudius* is found in the forest, *Torquatus* in the sunshine of open places, but in very damp weather both are found together at flowers on the borders of the woods.

Heliconidæ.—I reared *Heliconia erato* at Cametá; the larvæ are spinose, like the *Vanessa*, &c., and the chrysalis suspended by the tail. This family I look upon as mostly a modern creation, the species unfixed, very susceptible of change, in conjunction with the least modification of local circumstance; but these theo-

retical notions, I suppose, you do not care about. The neuration of the wings in many *Mechanites* and *Ithomiæ* differs in different individuals of the same species; therefore, Mr. Hewitson should not rely so much upon it.* I have found a good many *in cop.*, and the sexes have always had the closest resemblance in colour and markings. They are very gregarious in habits. A solitary species of *Mechanitis* or *Ithomia* in a locality is seldom, or rather never seen: there are always two or more nearly allied species flying together. This is a very strange fact. There are two species of large, brown, elongate-winged *Ithomiæ*, something like *Thyridia;* one species has one black bar across the wing, the other two. They are always found in company up the Tocantius, up the Tapajos, on the islands in the Amazon, and again at Ega. *Ithomia vestilla* is always accompanied by *I. Sao*.

H. Melpomone varies in a curious manner. Here, the other day, I took a pair in copulation, the female of which had red and black striped hind wings (like many species of the genus). What is very strange in this species is, that in ascending the river, it becomes more liable to vary. It first appears at Santarem, where, in a hundred specimens, you will only find the typical form, namely, a simple crimson belt on the fore wings. In Abydos, in a hundred specimens, perhaps twenty will have the crimson band broken in various ways. In Serpa nearly all the individuals are variations of the typical form.

I have no doubt they are hybrids (*i. e.* the varieties), and I can almost point out the species with which it hybridates. Strange to say, the hybrids occur in one district and not in another, and one style of hybrid only occurs in one district and not in the others, the species being equally abundant in all the districts.

Agrias.—I think the most magnificent group of *Nymphalidæ* in South America. They are very bold, strong, and rapid flyers; not at all like the *Catagrammæ* and *Callithece* in this respect, but like the *Paphiæ* and *Preponæ*. They fly for a short distance with inconceivable rapidity, and then settle on a leaf high up a tree, on a trunk of a tree where sugary sap is oozing, or at filth of some kind on the ground, with their wings erect, and are not very

* Mr. Hewitson is quite aware that the sexes of the same species of *Ithomia* sometimes differ in the position of the nervures of the posterior wing; he has, nevertheless, perfect faith in the different arrangement of the said nervures as a sure guide by which to discriminate closely allied species.—W. C. H.

easily scared away. The *Paphiæ* and *Preponæ* are exactly similar in manners. The larvæ, I have no doubt, are of the same form as that of *Apatura Iris*. I have bred a *Prepona*, the larva was naked, and the head of similar shape to *Apatura*. These genera and their allies form a very natural group in the *Nymphalidæ*.

Callithea Sapphira.—At the end of the dry season (end of December) this butterfly became very scarce on the wing, and the specimens were worn and faded. About the 12th of January its larvæ appeared in great numbers in the woods, feeding upon the leaves of young trees of various species. The larva is very beautifully banded with metallic violet colour and orange-red, and bristled with long, branching spines of the metallic colour, two of which, arising from the head, are three times the length of those arising from the body. At the beginning of February they generally changed into the pupa state, and about the middle of the month the perfect butterfly appeared, in beautiful dress and in great profusion, but only for a few days, for, with the continuation of the heavy rains in February and March, it disappeared again. I reared both the *C. Sapphira* and the *C. Leprieurii*. The larva of the latter is in the same way as that of the former spinose, but its colours are different, being banded with bluish black and greyish pallid green. The pupa is distinguished from that of *Sapphira* by having a few black spines.

The flight of *C. sapphira* is slow in comparison with all other *Nymphalidæ*. It settles frequently, and seeks the foliage of trees at a height of from ten to twenty feet from the ground. The female settles lower, but is very wary, and apt to escape into the thicket on being disturbed. The male is quicker in flight, and very rarely descends within reach of a moderate-sized net.

The *Catagrammæ* are more rapid and arrowy in flight than the *Callitheæ*. They repose on the trunks of trees, and are very much attracted by odours and filth on the ground, also by the sugary sap on the trunks of standing trees; they are much more wary than the *Agrias*, but still, in certain states of the weather, are not so difficult of approach as many other kinds of *Nymphalides*, as the *Epicaliæ* and *Cybdeles*, especially *C. Castalia*, which is the wariest butterfly I ever knew.

Cybdelis (?) *Pharsalia*, Hewits.—This is not a *Cybdelis*; it is a new generic form coming near *Callitheæ*. Its habits and mode of flight are very much like those of the *Callitheæ*. It frequents,

however, more frequently the moist margins of the water on sandy beaches (the *Callithece* do so sometimes), is very wary, and flies off in a sailing, circular manner to the borders of the forest, where it settles high up on the foliage. It is rare at Ega, and I did not see it on my excursion to Tunantins.

Caerois chorinæus.—I have found one or two of this species at Ega, and one at Tunantins. One I took on the Cupari, up the Tapajos; so that it is widely distributed, but it is one of the rarest of butterflies. The figure in Cramer is bad, as the caudal lobe is represented as turned in a wrong direction. I suppose some one has by this time discovered the curious structure of the fore leg in ♂ : it has the tibia and tarsus reduced to a rudimentary hook-shaped joint, like the *Mechanites* and *Ithomiæ*. The mode of flight of the species is exactly that of the larger brown *Satyri*, slow and heavy, near the ground, threading the shadiest thickets, and reposing on a leaf, wings erect, closed.

Mesosemiæ.—The *Mesosemiæ* form, with a few allied genera, a sub-family of *Erycinidæ*, nearly approaching the *Satyridæ*. Their neuration is after a distinct type.

The true *Mesosemiæ* are rather feeble in flight, but sustain themselves on the wing longer before settling than any other of the *Erycinidæ:* nearly all settle on the upper surface of leaves, with the wings held half erect. Two or three species, however, amongst them *M. Cræsus*, fly rather more rapidly, and settle underneath leaves with the wings horizontal, like the genus *Nymphidium*. All are found in the shades of the forest, never even by exception being seen in open grounds; some are only found in the gloomiest shades of the virgin forest; *Eunogyra Satyrus*, for instance, which flies very near the ground and settles under leaves only a few inches above it, the wings held horizontally.

Nymphidium, *Lemonias*, *Emesis*, *Symmachia.*—All these and many other forms are genera of the sub-family *Nymphydiinæ*, distinguished by their neuration, and found in thinned parts of the forest or on its borders; their flight very short and not rapid, settling always on the underside of leaves with the wings held horizontally. The species are not so local in their distribution as most other genera of *Erycinidæ*. We have several species common at all the stations I have visited, as may have been observed in the collections I have sent home to England.

The *Lemonias*, as figured on a plate by Mr. Hewitson, are a strange mixture :* there are a few species (*L. Pythia* is one) which, in style of colours, shape of hind wings, and mode of holding the wings in repose, are sufficiently distinct from the typical *Nymphidia* to be separated from them. They are found only in the virgin forest, fly low and by rapid jerks, and, settling on under-surfaces of leaves near the ground, hold their wings perpendicularly. The females differ much from the males.

Tharops. Doubl.—The metallic-coloured *Nymphidiæ*, I think, are a distinct group, and may be kept separate; their flight is extremely rapid, they are found only at the borders of the forest, and sometimes settle on flowers. Their wings are always held horizontally.

Anatole, Doubl., I also consider a distinct group, a genus of charming little creatures; they are found more in the centre of the forest, their flight rapid, wings horizontal in repose. *Lemonias Irene*, *L. Rhodope*, and two others, figured by Mr. Hewitson as *Lemoniæ*, I should consider *Anatoles*. *Irene* and another large species of similar colours I took at Ega, in the very centre of the forest, in a moist dell by the banks of a rivulet; they are very rare. Their flight and mode of repose is exactly that of *Anatole*. The female of *Irene* I have also found: it differs more from the male in colours than the female of white *Nymphidiæ* differ from their males.

Emesis.—The three or four species I have found are more rapid and jerky in their flight than the preceding, and are chiefly found at the borders of the forest and at flowers. Their mode of holding the wings in repose is the same as *Tharops*, &c. Although the neuration of the wings is identical with the preceding genera, their palpi distinguishes them quite sufficiently.

The *Symmachiæ* are very similar to the *Emesis* in their habits, as they are in structure. The two gilded green species found at Ega are very abundant at certain seasons; the females are found only at flowers on the borders of the forest, in company with the

* The mixture is from good authority. The genus is Mr. Westwood's, who could find no characters by which to separate the species composing the genera *Tharops* and *Anatole* from the other species of *Lemonias*. It would be a mistake to separate *Lemonias Irene* and *L. Pithia* of that plate from each other.—W. C. H.

Emesis (exceedingly rare, however), but the males accompany the *Cybdeles* to the moist margins of the river, where they settle and flit about the damp sand, sometimes by hundreds, forming a charming sight as you can well imagine.

Pupæ of Erycinidæ.—I have met with pupa of three genera only, viz. *Zeonia*, *Eurygona* and *Stalachthis;* the two former were secured to leaves by the tail, but laid horizontally on the leaf, with a fine silken thread passed over the body. The chrysalides of both have two faces; the under or ventral face is naked and flat, whilst the upper is convex and pubescent, most distinctly so in *Eurygona*. In *Stalachthis* it is secured by the tail only, but is inclined towards the leaf, and not suspended horizontally, as in the *Nymphalidæ*.

Lymnas.—I have taken six or seven species of this genus; they are all rare, and two of them are single specimens, which I have not yet sent to England. I exclude from the genus the specimens figured by Mr. Hewitson as *L. vitula*, on account of its different neuration. The true *Lymnas* (*L. electron* and allies) present two nervules emitted from the subcostal nervure before the end of the cell, in the fore-wings; whereas *L. vitula* has one nervule before and one after the end of the cell. In their mode of flight also the two forms differ. All the true *Lymnas* have a very rapid but short flight, settling, with wings extended, on the under surface of leaves of the lower trees on the borders of the pathways in the woods of second growth, while *L. vitula* flies slow and heavily, settling generally on the upper surface of the leaves. The only locality where I have found the *Lymnas* rather plentifully is the thinned dry woods of Santarem; in fact, in the same limited strip of wood where only in all the region *Callithea Sapphira* is found. In company with *L. electron* there were two or three very similar species, differing only in the colour of the spot on fore wings, and the red spots at base of wings. They were all flying together, and it struck me at the time that they were probably varieties, but as I never detected them promiscuously *in copula*, there is no alternative but to keep them separate at present. I have so often seen two or more closely allied species flying together, and yet keeping themselves perfectly distinct, that I find it safer to consider small differences as separate species, until positive proof offers of the contrary. I find when monographers at home are inclined to group apparent varieties together as one species on their own responsibility, they often make mis-

takes. The system of separating after all leads to less confusion; for instance, some of our friends considered *Megacephala cruciata* and *M. bifasciata* as one species, but how beautifully distinct they are in reality, when we know the fact that *M. cruciata* is confined to the Lower Amazons, or as far as Barra inclusive, and *M. bifasciata* to the Upper Amazons, all the hundreds of individuals I have met with offering the same points of difference respectively! *Lymnas vitula* is very common along the alleys in the forest at Ega in the showery seasons, June, July, November, January. The only other locality in which I have met with it is Areyros, on the Tapajos, but all the individuals found there are different in colour from the Ega ones.

The beautiful *Zeonia*, of which I sent you a fine series last July, I met with in a part of the forest near Ega, which I had traversed and examined before, many times, in all seasons. The first specimen I found was a straggler in a different part of the forest. On July 21st, after a month of unusually dry and hot weather, in ascending a slope in the forest by a broad pathway mounting from a moist hollow, choked up with monstrous arums and other marsh plants, I was delighted to see another of what had always been so exceedingly rare a group of butterflies; it crossed the path in a series of rapid jerks, and settled on a leaf close before me. Before I had secured it, I saw another, and then shortly after a third. I mounted to the summit of the slope, followed a branch pathway which led along the brow of the ridge, without seeing any more, but returned again to examine well the exact spot where I had captured the three, for it very often happens that a species is confined to a few square yards of space in the vast forest, which to our perceptions offer no difference throughout its millions of acres to account for the preferenee. I entered the thicket from the pathway, and a few yards therein found a small sunny opening, where many of the *Zeonia* were flitting about from one leaf to another, meeting one another, gamboling and fighting; their blue transparent tinge, brilliant crimson patch and long tails, all very visible in the momentary intervals between the jerks in their flight. I was very busy, you may imagine, at first in securing a supply of specimens; I caught perhaps 150, two-thirds of which fell to pieces in the bottom of the net, so fragile is their texure. I then paused to look around the locality, and endeavour to find the larvæ and pupæ. I walked through the thicket in all directions, and found the space peopled by the species was not more than from twenty to thirty square

yards in extent, but within this space they were innumerable; up the trees, so far as the eye could reach, the leaves were peopled with them; it is possible the brood belonged to some one tree. The only two pupæ I could find, it is true, were on two distinct kinds of trees, but this is no proof that the larva may not have fed on one tree only. I was disappointed at not finding the larva, although I searched well during this and the three following days; on the second day the butterflies were still coming out; on the third they were much fewer, and nearly all worn; and on the fourth day I did not see a single perfect specimen, and not a dozen altogether.

During all the time I worked the neighbourhood of the city of Pará I found but one specimen of a *Zeonia*. This was in 1848; the next time I saw the genus was at Altar do Chao, where I took a few of a very small long-tailed species, at flowers. At Ega, a few miles up the Teffi, I took one of another very handsome species at flowers, very distinct from all the others.

Syrmatia.—This very week I have captured the first specimen I have seen of this genus. It is very small and delicate, the tails excessively long and twisted, but I secured it quite perfect; it had doubtless just escaped from the pupa case, and fell motionless to the bottom of my net. It is a form intermediate between *Zeonia* and *Isapis*, in fact, a little *Isapis*, with tails. Its flight is exactly that of the *Zeonia*, progressing by vertical jerks; it crossed the path from the thicket on one side to a low tree, then, before I could reach it, started off again to a palm frond, where it rested on the under surface, gently fanning its wings like the *Zeonia*.

Charis.—I place in this genus a few species (seven or eight) which agree in their rather elongate wings of dark brown or blackish colours, with more or less of a silvery border; some of them are extremely common at all places on the Amazons, and in all seasons, every day in the year; for when the weather is so cold and gloomy that no other butterfly will appear these are sure to be seen along the forest paths, flitting about the foliage, settling frequently and reposing a long time, generally on the upper surface of the leaves, with the wings half raised. One or two of the species, however, alight at once on the under surface of leaves. They are not averse to the sun's beams, for in any sunny opening, wherever in fact a ray of sunshine pierces the forest canopy and illumines the sombre shades beneath, two or more males of these merry little fellows are sure to be seen fighting furiously in the

beam of light. It is the species with the snowy white fringes which I have always seen thus occupied.

Panara Barsacus was very common at Altar do Chao on the Tapajos; it occurs at Ega also, but much more rarely. Its flight is rapid and short, always near the ground, settling invariably on the under surface of leaves, with the wings horizontal. I see no difference whatever between the Ega and the Tapajos specimens of this species.

Calydnæ.—The metropolis of the *Calydnæ* is Altar do Chao, or, to speak more physical-geographically, the dry forests of the sandy region of the lower Tapajos; ascending the Tapajos they disappear, but are again in great numbers as to individuals (but some of the species wanting) at Villa Nova, which is very similar in physical character to the Tapajos region. At Obydos I believe I did not meet with more than one species; at Ega and Barra they are almost unknown; at Ega, in fact, I have only met with one specimen of the species most generally distributed about the country (not figured in Hewitson's plate). Strange to say, several of the species occur at Tunantins, which fact I can only explain by considering that the soil is of the same light and sandy nature at this place as at Villa Nova, whilst at Ega and at Obydos it is clayey. They frequent a peculiar sweet smelling inconspicuous blossom on the borders of the forest; these blossoms are found at Ega, as well as the other localities. I have about thirteen species; they form a distinct and natural genus in the sub-family *Nymphidiinæ*,—identical, I think, in neuration with *Nymphidium*, *Anatola*, *Tharops*, *Theope*, *Lemonias*, *Emesis*, *Symmachia*, *Charis*, *Mesene*, *Beotis*, and many other genera. These sub-families only confuse. The palpi are different from those of *Nymphidium*. As to the legs, I do not think they will offer stable characters in the family *Erycinidæ*. The female of one species, *Calydna Calamisa*, has the fore legs of a very peculiar form, the terminal joint of the tarsi being very large and oval; but I do not attach much importance to this, as similar strange aberrations of form in the fore legs are found without reference to other signs of affinity here and there in this family, as well as in the *Theclæ*. All the *Calydnæ* have a short but excessively rapid flight; the eye cannot follow them in their movements; they are found only in the very hottest and dryest weather, when the herbage on the open campos is withered by the inevitable daily sun for many weeks into a yellow dust, and almost all other animal life is hushed into languid repose.

When many other tribes, and whole orders of insects (as *Coleoptera*), have long ceased to appear, after two or three months' absence of rain, these charming little butterflies are in their element, flitting about with restless activity. At Altar do Chao I have seen many scores in a walk along the parched dusty alleys of the forest, in the month of November. Some of them settle on the upper surface of the leaves, as *C. Calitas*, gently opening and closing their wings during the brief intervals of their repose, others alight at once on the under surface in the manner of the *Tharops*, &c.; whilst others, as *C. Charila* and *C. Caieta*, are more especially fond of the sweet smelling blossoms above mentioned. When on the Tapajos I used to see three or four at a time imbibing the sweets in company with the Tapajos *Zeonia*, several *Theclas*, and sometimes an *Odontocera Mesene*. I think this will prove a natural group of butterflies, allied to *Anatole* on one side, but distinguished from them by the shortness of the palpi, and to *Charis* on the other, from which they will have to be distinguished by their colours and facies. I do not know the species which are included in the several genera. In my collection here I have nineteen species which I consider *Mesene*; all are small butterflies of bright and trenchant colours; all are found in woods of second growth, reposing with wings horizontal on the under side of leaves, and all are identical in point of neuration with *Nymphidium*, &c. Some of the species are very common, and generally distributed throughout the Amazons, and are the first insects one meets with on entering the woods behind the villages. Their flight is nimble, like that of the *Nymphidiinæ* generally.

Theclidæ.—In the immediate vicinity of Pará, the *Theclæ* are in astonishing variety, although the number of individuals of each species is very sparing. They people chiefly those parts of the forest of second growth which have once been plantations of fruit and coffee trees, and which are now overgrown by scattered bushes, young trees, or dense thickets of Melastomæ, Tucumá and Marajá palms, myrtles, mimosæ, &c.; but as they occur only in certain states of the weather, and are very local in their distribution, it requires long practice to collect them successfully. During the months of August and September, 1851, I paid very close attention to the *Theclidæ*, and succeeded in taking about eighty distinct species, after pairing fourteen or fifteen dissimilar sexes. All the species are remarkably alike in their habits, and do not differ in this respect from the European species. They fly by jerks, sometimes skipping backwards and forwards, and settle

frequently low on the leaves of bushes or Lycopodiæ. Sometimes I have seen them on the flowers of Melastomæ, which at rare intervals adorn these beautiful woods. The common *T. Marsyas* is frequently seen, but only in open grounds and road sides, where its soft and delicate blue is an ornament to the surrounding verdure. The large and rich species *T. Imperialis* and *T. Regalis*, on the contrary, are only found in the virgin forest, in some nooks along the pathways, where some opening in the umbrageous vault above admits the rays of the sun.

II. *On New Genera and Species of Longicorn* Coleoptera. Part IV. *By* Francis P. Pascoe, Esq., F.L.S., &c.

As descriptions of many of Mr. Wallace's Aru Longicorns are contained in the present Part, it may be, perhaps, interesting to make a few remarks on his general collection of *Coleoptera* from that island, including the adjacent one of Key. The first glance at once showed a complete dissimilarity of forms to those we are accustomed to see from Australia: group after group marked its Indian island character, and it was only after a close inspection that here and there an Australian form might be noticed.

Premising that I have only attempted a very slight sketch, as there were too many unpublished forms to allow of going into many details, I commence with the *Cicindelidæ*. This family was represented by *Tricondyla*, and *Therates*, no true *Cicindela* being present. *Carabidæ* were few in number, and belonged chiefly to *Lebia* and its allies. *Staphylinidæ* were also few, and not remarkable.

Nothing has struck me so much in all Mr. Wallace's "island" collections as the paucity of *Lamellicornes*. There are generally a few individuals of the cosmopolite *Onthophagus* and *Oryctes*, and perhaps some eight or ten *Cetoniadæ*, but rarely more than two or three examples of each. *Anoplognathus*, *Phyllotocus*, *Diphucephala*, *Liparetrus*, and other common Australian genera of this order, are wholly wanting.

Of the *Malacoderms* there were upwards of forty species, all rather small, and none particularly striking. The *Cleridæ* were entirely represented by *Stigmatium* and *Ommadius*, genera very abundant in the Indian Archipelago.

Three or four species of *Chrysodema*, gems even amongst the *Buprestidæ*, *Melanophila*, *Agrilus*, *Trachys*, and one *Melobasis*, comprised the whole of the family from Aru; not a single *Castiarina*, or any of its allies, so common in the very poorest Australian collections. *Elateridæ* were fairly represented, and had two or three curious forms among them.

The number of *Melasomes* appears to be very limited in the Indian islands; the Aru collection contained two or three obscure species of *Opatrum*, and few of the other *Heteromera* were common. *Mordella*, the most abundant genus, had six species; and of

Amarygmus, extending from Australia to Java, and even India, there were three or four.

Anthribidæ, the most characteristic group of the Indian Archipelago, seem to abound in Aru, there being not less than twenty-four species in the collection; it will be recollected that the *Eccelonerus bifasciatus*, Hope, is almost the only species of this family which we obtain from Australia. *Brentidæ*, too, were tolerably numerous; ten very interesting species being present. The common Australian genus *Belus* was represented by a single individual, which I believe is new. Among the *Curculionidæ*, *Alcides* was the most numerous in species; *Orthorhynchus* appeared to be common in Aru as in Australia, although the number of specimens was small; *Mecopus* was also frequent. Of the splendid Papuan *Eupholi* there were only two species, one of which, from Key, was new; they are probably excessively local.

The most abundant of the Australian longicorn genera, whether in species or in individuals, *Phoracantha*, was represented by a single specimen of *P. biguttata*, Don.; another longicorn also common to both countries was *Monohammus holotephrus*, Bois. Of other hitherto purely Australian genera belonging to this great order (of which there were 109 species in the collection), *Penthea* and *Symphyletes* alone were represented—that is, if the *Zygocera* published by Mr. Thomson be a true species of that genus: on the other hand, there was a considerable accession of species to many Indian forms, *e. g. Merionœda*, *Iolea*, *Driopea*, *Cacia*, *Gyaritus*, *Phlyarus*, *Cereopsius*, *Praonetha*, *Ropica*, &c. Of the Papuan *Tmesisternus* there was not less than twenty species. Among other described species belonging to this order were *Monohammus scabrosus*, Ol.; *Macrotoma Luzonica*, F.; *Callichroma Dorycus*, Bois.; *Clytus glaucinus*, Bois.; *C. Australis*, Bois.; *Cylindrepomus nigro-fasciatus*, Bois.; *Cacia Vanikorensis*, Bois.; *Glenea viridinotata*, Bl.; and several *Tmesisterni*,* including the splendid *Sphingnotus mirabilis*, Bois. By far, however, the finest insect in the collection was a noble *Batocera*, which, with its antennæ, was not less than ten inches in length; this has been most worthily dedicated to Mr. Wallace.

There were five *Eudomychidæ*, a family which is not, as yet, known to occur in Australia.

* My genus *Arrhenotus* (*ante*, vol. iv. p. 242), proposed on the supposition of *Sphingnotus mirabilis* being a true *Tmesisternus*, the only one with which I was then acquainted, being erroneous, *Arrhenotus* must be cancelled, and its species, *Wallacei*, be referred to *Tmesisternus*.

Finally, among the *Phytophaga*, *Coptocycla* was the most conspicuous genus, the Australian *Paropsia* not being represented.

This is not the place to enter into any details not connected with Entomology, but I cannot avoid expressing my conviction that the debateable ground between the Indian and Australian Faunas will be the northern or tropical portion of Australia itself, New Guinea belonging zoologically to the Indian Archipelago, to which it is closely connected through the Amboynas and the islands on its western coast; its almost equatorial position, too, favouring the probability of its productions being more analogous to those of the torrid zone than to those of the temperate regions of Australia. In accordance with this view we should expect to find many Indian forms in Northern Australia, and to some extent we already know this to be the case.

Amongst the many new species described in the present Part, I have had very reluctantly to propose several new genera, but in accordance with what appears to be the modern view of considering every primary group of species a genus, this was unavoidable. The characters upon which they are founded may be often considered very slight, but putting aside the fact that many of the specimens were unique, or from their rarity too valuable to be injured by dissection, it still appears to me that any attempt to assume a monographic completeness at present is premature in the face of a constant succession of new species. Without dwelling on this point, except to suggest whether, after all, the importance of generic characters is not somewhat overrated, considering the various modifications to which they are subject, and which in many cases deprive them of all force, it is evident from the vast accumulation of undescribed species in our collections that if they are ever to receive names (in our time at least), and without which no progress, so far as they are concerned, can be made, we must be satisfied to see them accompanied by comparatively slight descriptions; but unless we consider minute analyses of individual forms to be the Alpha and Omega of Entomology, this is not much to be regretted. Long descriptions are practically an evil, however much we may admire the ability of the describer.

Mallodon figuratum.

M. piceus; prothorace lato, depresso, marginibus crenatis, disco minutissime punctato, figurâ bi-triangulari politâ medio, fasciâque basin versus, exceptis; scutello punctato, mar-

gine lævi; elytris intricato-impressis; pedibus rugoso-punctatis, femoribus tibiisque armatis.

Australia (Sydney).

Pitchy, paler toward the end of the elytra; head, mandibles and first four or five basal joints of the antennæ coarsely punctured; prothorax broad, depressed, irregularly crenate at the sides, minutely but closely punctured, the disc having a raised triangular coarsely punctured polished patch, which is united to its fellow at the inner basal angle, a slight stem connecting it below with a scroll which runs along at the base, and is reflected upwards at the sides; scutellum finely punctured, the posterior margin smooth; elytra with intricate impressions as if worm-eaten; legs roughly punctured; thighs beneath and tibiæ externally armed with small spines.

Length 25 lines.

The figure on the prothorax, like the leaf of the Bauhinia, and the heraldic scroll beneath, will at once distinguish this *Mallodon*.

Mallodon fulvipenne.

M. brunneum, nitidum; elytris fulvo-testaceis, vermiculato-impressis, marginibus elevatis.

Aru.

Mas.—Capite mandibulisque peramplis; prothorace antice latiore.

Fœm.—Cap. mand. parvis; proth. postice latiore.

Reddish brown, shining; head very coarsely punctured, a deep impression between the eyes; prothorax nearly impunctate, the sides almost entire, the posterior angle in the female produced and hollowed out above; elytra pale fulvous, with shallow but rather coarse, confluent impressions, sutural and external margins with a narrow raised border; tips of the mandibles and claws dark brown.

Length (♂) 22 lines; (♀) 12 lines.

This and *Macrotoma Luzonica*, F., were the only *Prionidæ* in Mr. Wallace's Aru collection.

Macrotoma gemella.

M. castaneo-fusca; prothorace confertim punctato, lateribus discoque plagis vermiculato-rugosis; elytris testaceo-brunneis; scutello marginato, lævi, lateribus punctatis.

Australia (prope Sydney).

Dark chesnut brown; head, between the eyes, with coarse scattered punctures; prothorax transverse, narrowed and somewhat rounded anteriorly, the sides crenated, finely and closely punctured, two roundish patches on the disc meeting at the median line, and three others of irregular form at the side, corrugated as if worm-eaten; scutellum pentagonal, with a smooth raised border; elytra testaceous brown, with very numerous and intricate shallow impressions and points; femora and tibiæ armed with a double row of spines beneath; under surface finely punctured, except the posterior margins of the abdominal segments, the second, third and fourth with an impressed spot at the side.

Length 26 lines.

Very near *M. pallens*, Bl., MS.? but there the prothorax is uniformly punctured.

Lissonotus Shepherdi.

L. ater, nitidus; elytris truncatis, angulo suturali integro, exteriori in spinâ productis, fasciâ ante medium interruptâ, coccineâ.

Para.

Closely resembles *L. equestris*, but the fascia does not extend to the suture, nor is the sutural angle rounded; the spine is also more produced.

Length 7 lines.

Dedicated to our Secretary, to whose indefatigable attention the Society is deeply indebted.

Caragenia sericata.

C. fulvo-miniacea, sericeo-pubescens; prothorace rugoso, tuberculis duobus nigris disco instructis; elytris postice nigrescentibus emarginatis apiculatis; femoribus intermediis posticisque spinosis.

Para.

Fulvous red, with a silky pubescence, prothorax rugose, with two black tubercles on its disc, and a short lateral spine; elytra rather long, having a blackish tint posteriorly, and an elevated line from the humeral angle to the long apical spine, another line towards the suture, commencing beyond the middle but not continued to the apex; mesosternum and abdomen beneath with a drab-coloured silky pubescence; intermediate and posterior femora armed with a strong spine.

Length 10 lines.

NYSSICUS.

Head short, broader in front; eyes large, reniform; maxillary palpi larger than the labial, the two last joints obconic; antennæ long, the third to the sixth or seventh joints strongly spined at the apex; prothorax unequal, the sides armed; elytra elongate, biapiculate; legs long; femora clavate, unarmed.

This genus bears the MS. name of *Holacanthus*, Blanch., in some collections; but that word has been long ago used for a genus of fishes. It is chiefly distinguished from *Eburia* by its long maxillary palpi, and clavate femora. The type is *N. quadriguttatus*, Ol.

EROSCHEMA.

Head slightly produced in front; eyes rather large, reniform; antennæ shorter than the body, stout, hairy towards the base, the joints (except the second) sub-equal, dilated on one side; palpi short, the last joint subcylindrical, truncate; external maxillary lobe produced and rounded at the end; prothorax constricted almost into a neck anteriorly, its side with a stout tooth, the disc unequal; elytra parallel, depressed; legs short, last tarsal joint small.

The place of this very remarkable genus is, I think, near *Pteroplatus*, from which it differs in the palpi, constricted prothorax, head, &c.

Eroschema Poweri. (Pl. II. fig. 2.)

E. hirsuta, atra, infra nitida; prothorace maculis duabus rubris; elytris rubris, quadricarinatis, interstitiis punctatis; antennis articulis quinque basalibus barbatis.

Australia (Sydney).

Black, clothed above with dense short half erect hairs, beneath smooth and shining; prothorax with a smooth spot at the anterior margin, and another behind, and with the elytra orange red, the latter having each a sutural and three other raised lines, the interstices thickly punctured; legs very hairy.

Length 5 lines.

I have the pleasure of dedicating this to John A. Power, Esq., M. D., so well known as the discoverer of a vast number of our native insects, and to whose kindness there are few British collectors who are not indebted for some of their rarest specimens.

Didymocantha cylindricollis.

D. angusta, brunnea, hirtis fulvidis vestita; prothorace cylindrico, antice constricto.

Australia (Moreton Bay).

Narrow, reddish-brown, rather sparingly clothed with coarse stiff fulvous hairs, more densely on the scutellum; prothorax long, cylindrical, but suddenly contracted anteriorly; palpi and mandibles pitchy.

Length 6 lines.

TRICHOMESIA.

Head rather narrow and elongate anteriorly; mandibles short; labrum small; eyes slightly emarginate; palpi with the terminal joint oblong-ovate, obtuse; antennæ distant, robust, not longer than the body, the joints (second except) subequal; thorax convex, equal in length and breadth, narrower before; elytra rather depressed; legs short.

A genus which I think should be placed near *Uracanthus*. Mr. Newman, to whom I have dedicated it, informs me that in his MS. it bears the name of *Callidium digramma*.

Trichomesia Newmani.

T. nigra; elytris, palpis, pedibusque castaneis, illis lineâ albohirsutâ versus suturam ornatis.

Australia (Victoria).

Dull black; prothorax with a line of whitish hairs on each side, and another beneath it, which is continuous with one on the mesosternum; elytra, palpi and legs pale chesnut, the former with a broad stripe of whitish hairs on each, extending from the base to near the apex, and parallel to but not touching the suture, which is dark brown; under surface paler with whitish hairs, which are more dense on the sides of the abdominal segments.

Length 5 lines.

SEBASMIA.

Head porrect, small; eyes large, reniform; antennæ of moderate length, the basal joints nodulose, the fourth shortest (second excepted), the terminal notched; prothorax rugose, elongated, narrowed anteriorly; elytra rather large; legs short.

Closely allied to *Cerambyx*, from which it differs principally in habit, comparatively large elytra, and short feet, particularly of the tibiæ. The palpi were absent in the only specimen I have seen.

Sebasmia Templetoni.

S. picea, supra hirtis fulvis sub-sericeis tecta.
Ceylon.

Pitchy black, densely clothed above with fulvous yellow, somewhat silky hairs; prothorax irregularly corrugated; eyes and antennæ dark brown, the latter with the two first joints and face with a rusty yellowish pubescence; body beneath, femora and tibiæ pitchy; tarsi and under part of the meso-femora covered with pale rusty hairs; mesosternal process bilobed, on the sides of the mesosternum especially, and about the mouth are several long slender hairs.

Length 14 lines.

I have dedicated this, one of the finest Ceylonese insects, to R. Templeton, Esq.

Cerambyx venustus.

C. elongatus, piceo-brunneus, hirtis cinnamomeis dense vestitus; prothorace mutico, antice angustiore, transversim corrugato; elytris apice truncatis, suturâ in spinâ minutâ productis; antennis maris longissimis.
Ceylon.

Elongate, pitchy brown, densely covered with short thickish cinnamon-coloured hairs; eyes and apex of mandibles dark brown; prothorax unarmed, narrowed in front, coarsely and transversely corrugated; elytra truncate, with the suture produced into a short spine; antennæ of the male very long, the fifth and sixth joints spined at the tip.

Length 26 lines.

This very fine species is not uncommon in collections.

Cerambyx vernicosus.

C. niger nitidus, pube sericante pallide-griseo sparsim indutus; prothorace mutico, ampliato, rugoso, basin versus angustiore; elytris apice sub-bispinosis.
Ceylon.

Brownish or pitchy black, with a sparse, silky, pale greyish pubescence; prothorax unarmed, full and rounded, transversely rugose, narrower or constricted behind; elytra gradually diminishing from the shoulders to the apex, which is truncate, with a small tooth at each angle.

Length 14 lines.

Cerambyx versutus.

C. brunneus; capite prothoraceque fuscis, hoc irregulariter corrugato utrinque fortiter spinoso; elytris apice bidentatis; antennis pedibusque rufis.

Ceylon.

Reddish brown; head and prothorax dark brown, the latter irregularly corrugated with a strong spine on each side; elytra with two small teeth at the apex of each; legs and antennæ rufous brown; body beneath with a sparse silvery pubescence.

Length 12 lines.

Nearly allied to *C. consocius*, but the prothorax is transverse, irregularly and more finely corrugated, elytra larger and less strongly toothed at the apex, &c. *C. humeralis*, White, is also a closely-allied species.

Cerambyx consocius.

C. brunneus; prothorace angustato sub-transverse-corrugato, utrinque obtuse-dentato, elytris apice bispinosis; corpore subtus sericeo-pubescente; antennis pedibusque rufis.

Ceylon.

Reddish brown; prothorax narrow, deeply and nearly transversely corrugated, with an obtuse tooth on each side at about the middle; elytra widest at the base, the apex of each with two strong spines; antennæ and legs rufous brown; under surface with a sparse silvery pubescence.

Length 13 lines.

Cerambyx macilentus.

C. attenuatus, obscure piceo-fuscus pube grisescente indutus; prothorace mutico, corrugato; elytris obsolete punctatis, apice bispinosis, spinâ exteriori divaricatâ; antennis nodulosis.

Ceylon.

Attenuate, dull pitchy brown, with a slight greyish pubescence; prothorax narrowed in front, unarmed and rather finely corrugated; elytra obsoletely punctate, tapering from the base, with a broad slightly elevated somewhat oblique ridge, the apex bispinous, the outer spine strongly divaricate; antennæ nearly twice the length of the body, the four or five basal joints nodulose; legs moderate.

Length 13 lines.

A very distinct species of which I have only seen the male.

Cerambyx demissus.

C. sub-angustatus, fuscus, griseo-pilosus; prothorace mutico, plicato; elytris apice sub-truncatis.

India (Benares).

Rather narrow, dark brown, sparingly covered with greyish hairs, which are longer and slightly curved on the elytra, particularly the basal portion; prothorax unarmed, sub-transversely plicate; elytra somewhat truncate at the apex; antennæ moderate.

Length 6 lines.

Nearly allied to *C. egenus*, but the thorax is proportionably longer, more regularly plicate, elytra shorter, &c.

Hesthesis mœrens.

H. niger; prothorace margine antico elytrisque maculâ apicali stramineis, his testaceo-olivaceis; abdomine supra segmento primo tertioque flavo-marginata; femoribus ferrugineis.

Sydney.

Black, space between the eyes, anterior border of the prothorax, and small spot at the apex of each elytra, dull straw colour, the latter testacous olive, darker exteriorly; abdomen with a band across the first segment, and margin of the third above, bright yellow beneath, the first segment covered with a white silky pubescence; thighs ferruginous.

Length 8 lines.

I have not seen Mr. Newman's *H. bizonatus;* his description is too short to be of any use, but it differs from this species in the ferruginous base of its antennæ.

OXYLYMMA.

Head prolonged into a snout; eyes round, prominent, nearly entire, distant below; antennæ short, filiform, the fourth joint as long as the fifth, the third twice their length, the rest shorter; prothorax smooth, narrower in front; elytra short, depressed, each gradually narrowing to a point; femora stout, clavate; tibiæ lengthened; tarsi short, the first joint of the posterior not greatly exceeding the second in length.

The affinity of this genus is with certain small insects confined apparently to the Valley of the Amazons, which Mr. White has placed in *Rhinotragus*, and to which he also refers *Oregostoma*. It

appears to me, however, that these (*R. notabilis, molorchoides, trilineatus*, &c.) form a distinct group, essentially distinguished from both *Rhinotragus* and *Oregostoma* by their slender form, large eyes nearly or quite meeting below, antennæ, and greater length of the first joint of the posterior tarsi. For this group I propose the name of *Agaone*, and *Oxylymma* will differ from it in its more robust form, eyes, antennæ, elytra and legs.

Oxylymma lepida. (Pl. II. fig. 3.)

O. flava, occipite, oculis, antennis basi, humeris, fasciisque duabus elytrorum, atris.

Para.

Sulphur-yellow, eyes, top of the head, except a yellow spot between the eyes, band above the lip, and tips of the mandibles, black; prothorax smooth and polished, of a rather darker yellow; elytra thickly punctured, the shoulders, a band at the middle, and the apices, black; antennæ with the first joint, ring round the second, line along the third, fourth and fifth, and apices of the three last, black; legs with a line along the tibiæ, and extremity of the last tarsal joint and claws, black; beneath pale yellow, a broad band on the mesosternum, and two last abdominal segments, black.

Length $5\frac{1}{2}$ lines.

It will, perhaps, be as well to observe, that throughout these papers all Mr. Bates's important acquisitions are marked Para—the province, not the city, my earlier sets of this gentleman's collections having been unfortunately put away without noting the precise localities from which they were derived, but I hope eventually to supply the omission.

Thranius.

Head short; labrum very small; mandibles stout; eyes lateral, large round, scarcely emarginate; palpi rather short, the terminal joint ovate, somewhat inflated; antennæ short, filiform, the joints cylindric, the third longest; prothorax equal at the sides, gibbous above; elytra narrow, flat, scarcely covering the abdomen; legs short, slender; femora not clavate; tarsi with the first joint longest.

A genus allied to *Stenopterus*, but differing in the round eye, filiform antennæ, palpi, &c. &c.

Thranius gibbosus.

T. fuscus; elytris apice spinosis, fasciis tribus ferrugineis ornatis; antennarum articulis 8 et 9 albis; abdomine testaceo.

Ceylon.

Dark brown; prothorax longitudinally gibbous; elytra ending in a short spine, and having three ferruginous bands, the first commencing at the shoulder and curving round the scutellum, the second also at about the middle, and the last across the apex; antennæ with the eighth and ninth joints white; abdomen testaceous.

Length 10 lines.

Thranius bimaculatus. (Pl. II. fig. 7.)

T. fuscus; elytris vix apiculatis, pallide brunneis, in medio ochraceo-bimaculatis; antennarum articulis 8, 9 et 10 ochraceis.

Malacca.

Dark brown, head and thorax sparingly pubescent, the latter thickly punctured, and slightly gibbous anteriorly; elytra long, narrow, not covering the abdomen, closely punctured, the apex scarcely apiculate, light yellowish brown, with a round ochre spot on the middle of each; antennæ with the eighth, ninth and tenth joints pale ochre; abdomen beneath reddish brown.

Length 10 lines.

Homalomelas zonatus.

H. ater, nitidus; prothorace margine posteriore, scutello, fasciâ pone medium apiceque elytrorum et corpore subtus (segmentis tribus ultimis abdominis exceptis) albis; elytris haud carinatis.

Ceylon.

Black, shining; posterior margin of the prothorax, scutellum, a somewhat oblique fascia behind the middle, and apex of the elytra, densely clothed with short white hairs, under surface with a white pubescence, except the space round the posterior coxa and three last abdominal segments.

Length 6 lines.

Closely resembling *H. gracilipes*, which, however, differs in many respects, particularly in the absence of the carinated elytra.

Stenoderus labiatus.

S. ater, capite (fronte occipiteque exceptis) elytris (nisi suturo) aurantiacis; pedibus fuscis.

Australia.

Black; head (except the crown and part between the antennæ) and elytra orange red, the latter having a broad patch of violet on nearly the whole length of the suture; legs brown.

Length 7 lines.

All the species of *Stenoderus* are homogeneous, except *S. grammicus, deustus* and *rectus* of Mr. Newman; these are so different, yet so closely allied to each other, that their separation as a distinct group is advisable. I propose for it, therefore, the name of *Syllitus;* technically it may be at once distinguished from *Stenoderus* by its large oblong entire eyes.

Tritocosmia rubea.

T. sub-miniata; capite prothoraceque rubro-brunneis; antennarum fasciculo nigro.

Nova Cambria Australis.

Rather a dull red, inclining to orange, the head and prothorax reddish brown, slightly shining and minutely corrugated; eyes and tips of the mandibles dark brown; brush of the antennæ black; under surface with a silvery pubescence.

Length 8 lines.

Callichroma trogoninum.

C. nigro-chalybeatum; prothorace bi-impresso; fronte, prothorace lateribus elytrisque vittâ longitudinali, viridi-aurulentis; antennis pedibusque chalybeatis; corpore subtus argenteo-sericante.

Ceylon.

Chalybeate black; front, sides of the prothorax (which in the male has two slightly impressed marks), and a broad longitudinal stripe on each elytra, golden green; epistome testaceous; antennæ and legs deep steel blue; under surface with a silken silvery pubescence.

Length 12 lines.

Callichroma Thomsoni.

C. attenuata, aureo-viridis; prothorace maculâ oblongâ medianâ et vittis duabus elytrorum—unâ suturali alterâ mar-

ginali—antennis pedibusque chalybeatis; pectore pube subargenteâ tecto.

Borneo.

Slender, rich golden green; prothorax with an oblong central spot; elytra with two long stripes, the one sutural, disappearing before the apex, the other marginal; antennæ and legs dark steel blue; under surface dull green, the breast somewhat silvery; palpi pitchy, annulated with testaceous.

Length 8 lines.

Dedicated to James Thomson, Esq., of Paris, the author of the *Archives Entomologiques*, and other useful and beautifully illustrated works.

COLLYRODES.

Head large, suddenly constricted and forming a very slender neck behind the eyes, which are prominent and deeply emarginate; palpi rather stout, the terminal joint obtuse; labrum and jaws small; antennæ filiform, shorter than the body, the joints (second excepted) subequal; thorax long, very slender anteriorly and constricted behind; elytra parallel, depressed; legs slender; femora thicker in the middle; tarsi short, the joints gradually broader to the third.

A very remarkable genus, resembling *Collyris* among the *Cicindelidæ*, and which there can be little hesitation, notwithstanding the eyes, in placing near *Pseudocephalus*, Newman. I have named the only species after the author of that *magnum opus*—the "Genera des Coléoptères."

Collyrodes Lacordairei. (Pl. II. fig. 4.)

C. purpureo-violaceus; elytris viridi-atris, punctatis, pone medium singulis maculâ obliquâ apiceque albidis; antennis pedibusque testaceis.

Malacca.

Deep glossy purple violet; elytra greenish black, rather thickly punctured, with an oblique spot below the middle and apex of each, dull white; prothorax and whole body beneath smooth; antennæ and legs testaceous brown, the former somewhat darker at the base; pro- and mesosternum simple.

Length 6 lines.

Deuteromma mutica.

D. testacea; oculis nigris; prothorace mutico.

Ceylon.

Nearly allied to *D. testacea*, but narrower; the antennæ testaceous, not black, and the prothorax without the slightest trace of the lateral spine.

Length 3½ lines.

Obrium laterale.

O. brunneo-testaceum; prothorace lineâ laterali utrinque fuscâ; elytris postice latioribus fuscis, luteo-variegatis; antennis pedibusque testaceis.

Ceylon.

Brownish-testaceous; eyes and a stripe on each side of the prothorax dark brown, the latter elongate and narrowed behind; elytra dilated posteriorly, brown, varied with reddish-yellow blotches, one at the shoulder and extending obliquely on each side of the scutellum, a broad somewhat V-shaped band common to both at the middle, an oblong spot below, and another margining the apex; legs and antennæ testaceous.

Length 4 lines.

Obrium ibidionoides.

O. testaceum, nitidum; capite, prothorace, fasciâ latâ apicem versus, fusco-castaneis.

Australia (prope Sydney).

Pale testaceous, shining, antennæ and body beneath darker; head, prothorax, and a broad band, or rather patch, on the elytra near the apex, chesnut brown; prothorax nearly half the length of the elytra, narrower and somewhat constricted behind; antennæ rather shorter than the body.

Length 3½ lines.

Obrium? mœstum.

O.? rubro-fuscum, validiusculum, confertim punctatum; oculis nigris, sub-integris; prothorace equali, lateribus rotundatis; pedibus sub-brevibus.

Ceylon.

Reddish-brown, deeply and thickly punctured (including the head); eyes black, rounded, slightly emarginate; prothorax nearly equal, the sides rounded; elytra nearly parallel, not much wider than the thorax, the apex simple; legs rather short; under surface dark brown.

Length 4½ lines.

Not a true *Obrium*, but with one greasy specimen only before me I am unwilling to propose a new genus.

Clytus ascendens.

C. angustatus; prothorace nigricante, sub-globoso, confertim punctulato; elytris atris, humero fasciisque duabus (unâ medianâ alterâ apicali) canis; lineâ basali arcuatâ alba.

Ceylon.

Narrow, but not elongate; prothorax greyish black, somewhat globose, thickly and finely punctured; elytra black, the shoulders, band on the middle, and another at the apex, pale cinereous, from about the middle of each elytron, and above the median band, ascend a narrow, curved, very distinct whitish line, which meets its fellow immediately below the scutellum; antennæ filiform, half the length of the body, the fourth and fifth joints slightly spinous at the extremity, the basal joint yellowish brown; legs slender, elongate, black.

Length 4½ lines.

The colours of this insect resemble those of *C. rusticus*.

Clytus Walkeri.

C. sub-angustus, cinereo-pubescens; prothorace maculis duabus, elytris singulis tribus margine exteriore, atris; antennis muticis.

Ceylon.

Rather narrow, covered with cinereous hairs; prothorax oblong, elliptic, with two round black spots; elytra sub-truncated, with three large somewhat irregular black patches on the outer side of each, and extending to the margin, but not meeting at the suture, the first near the base, the second in the middle, and the last rather distant from the apex; antennæ nearly filiform, unarmed, shorter than the body.

Length 4½ lines.

Intermediate between *C. elongatulus* and the more typical forms. Dedicated to Francis Walker, Esq., F.L.S., &c.

Clytus Balyi.

C. subelongatus, fulvo-aureus; elytris, singulis, maculis tribus atris ornatis; antennis longis, setaceis; femoribus tibiisque posticis apice fuscis; mesosterno abdomineque pube flavo-argenteo-tectis.

India.

Rather narrow, covered with a rich dark golden yellow pube-

scence, which on the mesosternum and abdomen verges on silvery; eyes, mandibles, and three spots on each elytron black; antennæ rather longer than the body, in the male setaceous, none of the joints spined; legs with femora and tibiæ brown at their tips.

Length $5\frac{1}{2}$ lines.

Clytus assimilis, Hope, is the nearest ally of this pretty species, which I have named after Joseph S. Baly, Esq., author of a "Monograph of the *Hispidæ*," and the possessor of an unrivalled collection of *Phytophaga*.

Clytus Bowringii.

C. elongatus, olivaceo-cinereus; elytris lineâ lunari pone humeros et fasciis duabus medianis, nigris; antennis pedibusque gracillimis.

China (Hong Kong).

Narrow and elongate, with an olive greyish pubescence; prothorax oblong, swollen in the middle; elytra with a large lunar mark behind the shoulder, a black rather oblique fascia behind, and another broader one before the apex, black; antennæ slender, not quite the length of the body, the first and fourth joints acutely spined; legs dull testaceous, very slender and elongate, especially the posterior pair.

Length 5 lines.

Belonging to the *elongatulus* group. I have dedicated it to J. C. Bowring, Esq., who has most assiduously investigated the Entomology of the island of which it is a native.

Brachytria pulcherrima.

B. purpureo-rubra; prothorace lateribus fuscis; elytris vittâ laterali viridi-resplendente.

Australia (Moreton Bay).

Purplish red, furnished with many long scattered hairs; prothorax thickly punctured, with the sides brown; elytra narrower posteriorly; bicarinate with coarse confluent punctures, and having from the shoulders to near the apex a brilliant stripe of golden green, which, as it passes into the red, becomes purple and then violet; legs, antennæ and under surface brownish red; apex of the elytron fasciculate.

Length 7 lines.

This beautiful insect is unquestionably congeneric with *B. latebrosa*, Newm. I should have hesitated to unite it with *B. gulosa*, the type of the genus.

Oreodera cretifera.

O. fulvo-grisea; elytris lateribus albo-plagiatis; pedibus brunneo-variegatis.

Brasilia.

Fulvous grey; prothorax with three tubercles on the disc and one at the side; elytra tuberculate at the base, the external margin at about the middle with a large oblong chalky white patch; legs varied with brown; femora near the tips with a pale flexuous ring; epistome and palpi testaceous.

Length 7 lines.

Trypanidius geminus.

T. piceus, olivaceo-brunneus; prothorace convexo; elytris punctatis, basi granulatis, apice sub-truncatis, pone medium maculis duabus fuscis, approximatis.

Brasilia.

Rather short, pitchy, with an olive brown pubescence; prothorax convex, the lateral spine small, a line of impressed points along the posterior margin; elytra punctured, more thickly at the base, where there are also a few granulations, the apex slightly truncate, behind the middle two dark brown spots with a pale border closely approximate, beyond these and towards the outer margin a small patch of pale ochreous; beneath dull pitchy, the sides of the abdominal segments spotted with pale brown; antennæ of ♀ scarcely longer than the body; tarsi pale silky yellow.

Length 6 lines.

Ægomorphus remotus.

Æ. piceus, pube griseo-cervino tectus; prothorace trituberculato; elytris basi confertim punctatis, granulatis, apice spinosis.

Para.

Pitchy, with a greyish fawn-coloured pile; prothorax short, its disc trituberculate, the lateral spine at about the middle, a line of impressed points along the anterior margin, and a second line at the posterior; elytra rather depressed, much punctured and granulated at the base, the apex ending in a spine, below the middle near the suture a pitchy spot, and by the side a curved line of the same colour, having two or three patches connected with it; antennæ much longer than the body in ♀, reddish brown, darker at the extremities; tarsi brown, the last joint very long.

Length 8 lines.

The fore and intermediate legs of this species are unusually distant at their insertion.

Lasiopezus Whitei.

L. fusco-piceus, pubescens ; elytris basi cristatis, cinereo-fuscoque variegatis, tertio apicali, maculâ mediana irregulari, prothorace, mesosterno, abdominque segmentis tribus ultimis, albidis.

Natal.

Differs from *L. marmorator*, F., in the prothorax without the brown central patch, and the absence of the broad median band ; the elytra are also less depressed. In several specimens of both species which I have examined these differences are constant.

Length 10 lines.

I have changed the old name of this genus, *Lasiodactylus* (Dj.) Blanch., into *Lasiopezus*, the former having been preoccupied (by Perty) for a genus of *Nitidulidæ*. This species, I need hardly say, I have dedicated to Mr. White, of the British Museum, to whom few Entomologists of the present day are not indebted for many valuable hints (too many sometimes, perhaps, to be always conveniently acknowledged), and who first pointed out to me the distinctive character of this species.

Polyrhaphis Jansoni.

P. latus, fulvescens ; capite, antennarum articulis duabus basalibus, femoribus, tibiisque nigris.

Para.

Habit of *P. spinipennis*, Lap. ; head, two first joints of the antennæ, thighs (except at the tips), tibiæ, end of the last tarsal joint, claws, and prosternum, black ; prothorax and elytra with a fulvous pile ; under surface paler ; epistome dull yellow ; tarsi covered with long golden yellow hairs.

Length 12 lines.

The prothorax has a strong straight acute spine on each side, and two smaller ones on its disc, as in *P. spinipennis ;* the arrangement of the tubercles on the elytra is also nearly the same as in that species. Dedicated to the curator of the Society, to whose well-known skill and critical acumen I have been often deeply indebted.

Onychocerus albitarsis.

O. ater, grisescente-brunneoque variegatus; prothorace lateribus productis, disco trituberculato; antennis glabris tibiisque annulatis, tarsis albidis.

Brasilia.

Black, middle of the third antennal joint and base of the fourth, head, prothorax, except the three tubercles, base and posterior half of the elytra, middle of the tibiæ, and tarsi, greyish white; elytra with a double series of large black granulations, the middle and patch posteriorly reddish brown.

Length 6 lines.

The antennæ have no trace of the hairy fringe which forms so beautiful an appendage to the terminal joints of the other two well-known species; in the one described by Mr. Chabrillac, no mention is made of it. I am indebted for my specimen to Fred. Bond, Esq.

DYSTHÆTA.

Head rather narrow; eyes broadly emarginate; labrum large; mandibles obtuse; external maxillary lobe elongate; antennæ somewhat approximate, longer than body, setaceous, the third and fourth joints longest, the rest sub eqnal (second excepted); palpi elongate, the terminal joint obtuse; prothorax quadrate, irregular, the sides spined; elytra broadest at the shoulders, decreasing posteriorly; legs rather long, the tarsi not dilated, the first joint longest.

With no very salient characters, this genus is quite different in habit from any other with which I am acquainted. Its affinities are doubtful.

Dysthæta anomala. (Pl. II. fig. 6.)

D. pubescens, rufo-brunnea, albo-fuscoque variegata; elytris basi parce, apicem versus, remote punctatis.

Australia (Moreton Bay).

Pubescent, light reddish brown, varied with dark brown and a little white, in irregular lines shading into each other; on the prothorax these lines are longitudinal, two dark ones particularly on each side, and a paler one in the middle; on the elytra, which are sparingly punctured at the base and becoming even less so towards the apex, there are five series of transverse bands, more or less zig-zag, of which the middle one is formed like the letter W, with the anterior portion of it picked out with white; legs and under surface with a greyish pubescence; mesosternum bilobed posteriorly; elytra obliquely truncate at the apex.

Length 7 lines.

Zygocera MacLeayi.

Z. elongatus, piceus; prothorace gibboso, tuberculis duabus bifidis medio instructis; elytris albo-maculatis, basi tuberculatis, rude punctatis, apice obliquo-angulatis; tarsis albidis.

Australia (Sydney).

Elongate, pitchy black; head with a white line round the eye; prothorax narrow, the disc with two elevated bifid tubercles, between which are two longitudinal white lines, the sides with a stout slightly projecting spine; elytra deeply and coarsely punctured, prominent at the shoulders, gradually decreasing to the apex, which is obliquely truncate, forming a sharp angle, but not spined, the base of each near the scutellum with a very elevated tubercle, and the whole surface with several small spots formed of white hairs scattered over it, but particularly below the tubercles and along the suture; antennæ with the upper joints annulated with white; legs with a greyish pile, which is nearly white on the tarsi, post-tibiæ darker at the end; mesosternum slightly produced anteriorly.

Length 11 lines.

Dedicated to W. S. MacLeay, Esq., of Sydney, author of "Horæ Entomologicæ," "Annulosa Javanica," &c.

Zygocera pentheoides.

Z. lata, picea, albo-irrorata; prothorace medio bituberculato lateribus fortiter productis; elytris basi sub-gibbosis, cristatis, humeris prominulis, rude punctatis, apice rotundatis; tarsis articulis primis duobus albis.

Australia (Swan River).

Broad and rather depressed, covered with small spots formed of white hairs, which on the middle of the elytra are somewhat confluent; a white line before and behind the eye; prothorax with two tubercles on the disc, the spine at the side strongly produced; elytra broad and projecting at the shoulders, the base slightly crested, the apex rounded, the whole coarsely punctured; tibiæ darker at the end, two first tarsal joints white; antennæ scarcely longer than the body; mesosternum strongly produced.

Length 9 lines.

British Museum.

Zygocera bifasciata.

Z. sub-depressa, pube griseo-fulvescente tecta; prothorace elytrisque maculis fasciisque fuscis ornatis, his tricarinatis, basi antice productis.

Australia (Sydney).

Rather depressed, with a greyish-yellow pile, spotted and striped with brown; front and cheeks with vertical, prothorax with transverse lines; the elytra with three raised lines, the two inner terminating in the sutural and outer spine respectively, the other confined to the basal half, not crested, but the base projecting forward between the shoulder and scutellum, with two bands, one before, the other behind the middle, and numerous small spots, those near the base having a shallow puncture in the centre; body beneath pitchy, pubescent on the sides; antennæ and legs dark brown, the latter with fulvous hairs; palpi testaceous; eyes black.

Length 8 lines.

Zygocera plumifera.

Z. picea, grisescente pubescens, fusco-maculata; prothorace trituberculato; elytris basi cristatis plumiferis; plagâ laterali pone medium maculisque fuscis.

Australia (Sydney).

Pitchy, with a greyish pubescence, varied with brown spots and lines; head with vertical stripes on the cheeks and a broad patch on the vertex, which is divided by an impressed line; prothorax with three tubercles nearly connected together, two transverse lines and a few spots anteriorly; elytra gibbous at the base, crested, the crest crowned with soft thick-set hairs, a lateral patch behind the middle and several spots scattered over the surface, those on the basal half with a coarse puncture in the centre of each; beneath pitchy, the sides pubescent, spotted; antennæ pitchy.

Length 6 lines.

Zygocera pumila.

Z. angustior, brunneo-picea, pube grisescente tecta; prothorace sub-tuberculato; elytris bicarinatis, basi elevatis, cristatis, punctato-maculatis.

Australia (Sydney).

Narrow, reddish pitchy, with a greyish pubescence; top of the head and prothorax with transverse, brown, more or less interrupted lines, the latter with a slight tubercle in the centre, lateral spine very short; elytra with two raised lines terminating in the apical spines, elevated at the base, with a slightly plumose crest, and having a few dispersed punctures, each in the centre of a chocolate-brown spot, a band of the same colour at the base between the two crests and across the scutellum; under surface

with a greyish pile, except the central part and last abdominal segment.

Length 5 lines.

Zygocera complexa.

Z. angustior, sub-depressa, fusco-castanea, lineis maculisque ochraceis pubescentibus induta; elytris tricarinatis, basi vix productis; antennis tibiisque brunneis.

Aru.

Narrow, depressed, dark chesnut brown, with lines and spots formed by short dull yellowish hairs; head with two broad lines in front, two narrower on the occiput, and an oblique one below the eye; prothorax with three transverse lines, the intermediate united to the others at the middle and sides; elytra nearly simple at the base, tricarinate, the sutural and outer carinæ terminating in spines at the apex, with an intricate series of markings, among which three irregular fasciæ may be distinguished—one before the middle, one beyond it, and the third near the apex; antennæ and tibiæ reddish-brown; palpi dark brown, the joints yellow at the tips.

Length 5 lines.

Rather narrower and more depressed than the other species, the spine at the side smaller, and no crest at the base of the elytron, which is slightly produced anteriorly, as in *Z. bifasciata*.

Zygocera barbicornis.

Z. piceo-brunnea, griseo-pubescens; elytris punctato-striatis, basi simplicibus, maculâ subocellatâ ornatis; antennis articulis primis sextis infra barbatis.

Australia (Moreton Bay).

Light pitchy brown, more or less varied with greyish hairs; prothorax rather narrow, with the lateral spine short and broad; elytra coarsely striato-punctate, with a dark subocellated spot on the lower half, near the outer margin, the apex truncate, with the suture slightly produced; antennæ longer than the body, with the first six joints strongly bearded beneath, the last five simple, and together not longer than the third.

Length 7 lines.

This will probably be considered the type of a new genus, nearly allied to *Zygocera*.

Hypselomus pupillatus.

H. cervinus; elytris basi punctatis, disperse fusco-maculatis, pone medium maculis duabus connexis, una albâ, alterâ fuscâ; antennis pedibusque fuscis, his cervino-irroratis.

Para.

Greyish fawn-colour, head and prothorax darker, the latter with about five tubercles and a strong tooth at the side near the base; elytra with a strong tubercle at the shoulder, rather gibbous towards the scutellum, and the base thickly punctured, a few brown spots along the suture and near the apex, while below the middle there is a larger spot, above which and connected to it is another, but pure white and very distinct; antennæ and legs dark chocolate brown, the latter sprinkled with numerous small greyish spots.

Length 10 lines.

Hypselomus variolosus.

H. pallide olivaceo-brunneus, capite prothoraceque nigro-irroratis; elytris maculis nigris aspersis, basi granulatis; antennis articulo primo femoribusque undulato-variis.

Para.

Pale olive-brown, with a slightly greyish tint; head and prothorax with minute black crowded spots, the latter with about eight tubercles on its disc; elytra with several well-defined scattered black spots, and with from ten to a dozen glossy black granulations on each shoulder; first antennal joint and femora marked with numerous fine wavy lines of dark brown and olive; eyes coppery; beneath sprinkled with black.

Length 10 lines.

Hypselomus paganus.

H. fuscus, pallide olivaceo-variegatus; prothorace subquinquetuberculato; elytris basi cristatis; antennarum articulis, primo excepto, basi annulatis; tarsorum articulo ultimo fulvo, apice nigro.

Para.

Dark brown, obscurely varied with pale olive; prothorax with a few black spots and about five tubercles on its disc; elytra produced at the shoulder, and slightly crested, with few punctures; antennæ and legs black, except a small pale olive ring at the base of all the joints of the former, except the first, and the basal three quarters of the last tarsal joint, which is fulvous; abdomen beneath dark, the sides brownish yellow.

Length 6 lines.

Hesycha Nyphonoides.

H. piceo-brunnea, fulvo-varia ; prothorace bituberculato ; elytris maculâ obsoletâ irregulari pone medium.

Para.

Pitchy reddish-brown, varied with small fulvous approximate patches of pubescence, which rather below the middle of each elytron are mixed with a little white, the fulvous patches behind this being more distinct, so as to give the appearance of a border to the naked eye; prothorax with a slight tubercle on each side the median line, the lateral spine small; antennæ with the eighth and following joints pale at the base.

Length 8 lines.

A certain similarity to *Nyphona saperdoides* suggests the name.

Hesycha albilatera.

H. fusca, griseo-varia; elytris lateribus albo-plagiatis.

Para.

Dark brown, sprinkled and blotched with a yellowish grey; head as broad as the prothorax, which is cylindrical and slightly toothed at the sides; elytra narrow, the base punctured, the shoulders scarcely prominent, a large white lateral patch extending two-thirds their length, and edged behind by a dark brown spot; antennæ twice as long as the body (♂); spine of the anterior coxæ slender, incurved.

Length 7 lines.

Ærenea terrena.

Æ. fusca, hirsuta, dense griseo-pubescens ; antennis linearibus, ciliatis.

Para.

Dark brown, with a short, dense, grey pubescence, and setulose hairs everywhere interspersed ; tarsi, last five or six joints of the antennæ, and spot on each side near the scutellum, common to elytra and prothorax, dark brown ; antennæ ciliated, nearly as long as the body, and, except the first and last joints, of nearly equal thickness throughout.

Length 3½ lines.

Ærenca cognata.

Æ. fusco-cinnamomea ; occipite, prothoracis disco, scutello, antennisque fulvo-brunneis, elytris maculâ obliquâ laterali tarsisque albidis ; femoribus, tibiisque variegatis.

Para.

Dark cinnamon brown, front white ; back of the head, disc of

the prothorax, scutellum and antennæ fulvous brown; elytra sparingly punctured, a large oblique band-like spot at the side meeting at the suture; legs varied with pale zig-zag rings, tarsi white; beneath dark brown, shining.

Length 6 lines.

Allied to *Æ. trigona*.

Leiopus suffusus.

L. breviter ovatus, purpureo-niger, obscure cervino-varius; prothorace spinâ laterali posticâ; elytris seriatim punctatis, apice rotundatis; femoribus clavatis.

Aru.

Shortly ovate, purplish black; prothorax of a dull fawn-colour, with a large dark spot on the disc, and a small lateral spine posteriorly; elytra regularly punctate, rounded at the apex, dark purple, with blotches of a sordid fawn colour; beneath dull greyish; antennæ and legs reddish brown, the former ciliated beneath, the latter rather short.

Length 2 lines.

Exocentrus hamaticollis.

E. fuscus; prothorace sub-elongato, spinâ recurvâ longâ utrinque armato; elytris castaneo-cinereoque variegatis; antennis articulo basali ferrugineo.

Aru.

Dark chocolate brown; prothorax slightly elongate, with a long slender recurved spine on each side; elytra having at the shoulder a large irregular patch of reddish brown, below this two oblique wavy lines meeting at the suture, and another at the apex; antennæ ciliated beneath, its basal joint and base of the posterior femora ferruginous.

Length 2¼ lines.

In some specimens the white marks are nearly obliterated, but the remarkable thoracic spine will at once distinguish the species.

Exocentrus hispidulus.

E. niger, pubescens, setulosus; prothorace transverso, utrinque fortiter spinoso; elytris fulvo-subtessellatis plagisque variis; antennis articulis basi testaceis.

Aru.

Dull black, pubescent, with long setulose hairs clothing the upper surface and antennæ; prothorax with a broad fulvescent stripe on each side above, and having a strong triangular recurved spine at

the side; elytra rather broad, sub-tessellated with fulvescent, and having three or four irregular patches of the same colour; antennæ with the base of nearly all the joints testaceous.

Length 3 lines.

Exocentrus inclusus.

E. griseus, setulosus; capite fusco, prothorace transverso utrinque angulato; elytris pone medium fasciâ fuscescente flexuosâ ornatis; antennarum articulis basi pallidis.

Natal.

Greyish pubescent clothed with long setulose hairs, but principally on the elytra, where they arise from round naked spots in the pubescence; prothorax transverse, the side triangularly dilated, but not spined; elytra with a pale brown flexuous line, like the letter M, behind the middle; antennæ with the bases of the joints paler.

Length $2\frac{1}{2}$ lines.

Gyaritus lævicollis.

G. piceo-fuscus, pubescens, crinitus; prothorace lævi, gibbosulo; elytris muticis, cinereo-variis, fasciâ obliquâ latâ basali et plagâ laterali, apicem versus, cinereis.

Aru.

Pitchy brown, pubescent, with long, slender, erect, dispersed hairs; prothorax rounded, smooth, slightly raised in the middle; elytra unarmed, pitchy, with a broad oblique band from below the shoulder, forming, with its fellow, a V-shaped mark, and a large lateral patch at the posterior third, cinereous; under surface pitchy; antennæ with a few stiffish hairs.

Length $2\frac{1}{2}$ lines.

The generic characters of *Gyaritus* will require to be enlarged to include this species; it will still, however, be distinguished from *Pogonochærus* and its allies by the tumid joints of the antennæ, and from *Phlyarus* by the simple tibiæ.

Nyphona Bakewellii.

N. picea, sparse pubescens; capite prothoraceque griseatis; elytris nigro-viridibus, plagâ mediâ (albo-variâ) maculisque griseis irroratis.

Australia (Moreton Bay).

Rather short, pitchy, covered with a dark-green pubescence varied with grey: head and prothorax at the sides entirely grey; elytra obscurely spotted with grey, in the middle of each two or three approximate spots, below which is a white one, the whole having

the appearance of an oblique patch; legs and antennæ with sparse greyish hairs.

Length 5 lines.

This and the two next—*pullata* and *insularis*—differ in the smoother prothorax from the typical *N. saperdoides*, but in another species from Aru, in Mr. Wallace's private collection, obviously congeneric, the prothorax rises into three longitudinal crests.

I have dedicated this species to R. Bakewell, Esq., whose researches in Australia have added a great number of new species to our lists, especially among the *Hymenoptera*.

Nyphona pullata.

N. oblonga, picea, punctata, pube pallide-griseâ sparse tecta; elytris sub-parallelis plagâ mediâ, maculisque cinereis, obscure irroratis.

Aru.

Oblong, pitchy, coarsely punctured, sparingly covered with a pale greyish pubescence; elytra nearly parallel for about two-thirds of their length, then gradually contracting and rounded at the apex, with an obscure greyish patch on the middle of each, and several small spots of the same colour (but all formed by denser and longer pubescence) scattered over their surface.

Length 6½ lines.

Nyphona insularis.

N. picea, punctata, hirsutula, pube fulvidâ sparse tecta; elytris brevibus sub-parallelis, fasciâ pone medium irregulari, obliquâ, sub-griseâ, fulvâque variâ.

Sumatra? Aru.

Pitchy, coarsely punctured, with a sparse fulvous pubescence slightly varied with greyish, and mixed with short stiffish hairs; elytra rather short, the sides nearly parallel, behind the middle an irregular oblique greyish band having on it patches of fulvous; beneath greyish hairy.

Length 5 lines.

My specimens of this species were originally in the collection of the Zoological Society, without a locality, but derived apparently from Sir S. Raffles; they prove to be identical with a single specimen from Aru.

Coptops nanus.

C. griseo-pubescens, maculis fusco-brunneis irroratis; elytris sub-trifasciatis; antennis pedibusque annulatis.

Aru.

Rather short, with a pale greyish pubescence, and sprinkled with small brown spots, the elytra presenting three imperfect faciæ of the same colour; antennæ with the upper part of each joint dark brown; legs varied, the tarsi darker; under surface dark brown.

Length 4½ lines.

Mesosa columba.

M. pallide-fuscescens; prothorace disco, punctis quatuor et plagâ laterali, fuscis; elytris disperse-punctatis, maculis tribus fuscis, albo-submarginatis, longitudinaliter dispositis; antennis pedibusque fuscis, grisescente-annulatis.

Ceylon.

Pale greyish-brown; prothorax with four spots (two anterior and two posterior), and a patch at the side beneath, dark brown; elytra punctured with three brown spots placed longitudinally, and more or less bordered with white, and two or three very obscure marks—brown and white—at the side; antennæ dark brown, the base of all the joints, from the third inclusive, greyish white; legs varied with dark-brown and pale-greyish; under surface dull grey.

Length 6 lines.

Penthea conferta.

P. picea, pube fusco-griseâ tecta; corpore supra, femoribus, antennarum articulo primo, granulis numerosis nitidissimis, aspersis; elytris singulis pone medium plagâ obliquâ obscurè cinereâ ornatis, apice truncatis.

Aru.

Pitchy, covered with a thick greyish-brown pile, and having the whole of the upper surface, including the first joint of the antennæ and femora, furnished with numerous glossy black granules, each having at its base, posteriorly, a short stiff hair; elytra truncate at the apex, behind the middle an oblique, obscure, cinereous patch; mesosternum with a small vertical tooth.

Length 10 lines.

This has quite the habit of *P. granulosa*, Guér.

Symphyletes metutus.

S. robustus, fuscus, ochraceo-griseoque variegatus; elytris subquadricarinatis, apiculatis; coxis tibiisque anticis maris calcaratis.

Aru.

Robust, dark-brown, varied with ochre and grey; on the head fine ochreous lines, round the eye, on the front, &c.; the prothorax irregularly tumid, slightly spined anteriorly at the side, varied with obscure ochraceous; elytra broad at the shoulder, gradually diminishing to the apex, which is truncate, the outer angle forming an obtuse process, the base with several black shining granules and coarsely punctured below, each elytron with four slightly elevated lines, the marginal only reaching the apex, the side having four or five light greyish patches, varied slightly with ochreous, which by their confluence form a large semicircular blotch, with the convexity towards the suture; a patch also, composed in the same manner of light grey and ochreous, bound the scutellum, and a third smaller one below common to both elytra; antennæ and legs with small spots of grey; anterior coxæ of the male armed in front with a large curved spine nearly the length of the former; the tibiæ also with a very strong spine internally; the antennæ not fringed.

Length 12 lines.

This fine species has not the terminal joint of the antennæ curved at the apex as in *S. pedicornis* and the more typical species.

Symphyletes sodalis.

S. piceus, griseo-pubescens, luteo-irroratus; prothorace sub-tri-tuberculato; elytris basi granulatis punctatisque, apice rotundatis, plagâ laterali, fasciâ dentatâ pone medium, maculisque apicem versus, albidis.

Australia (Moreton Bay).

Very like *S. maculicornis*, which, however, is narrower; the thorax scarcely tuberculate, but rather ridged transversely; the granulations and punctures at the base of the elytra less evident, being almost buried in the pubescence.

Length 12 lines.

Golsinda infausta.

G. niger; prothorace dorso bigibboso; elytris rugosis rude punctatis, humeris productis granulatis, basi apiceque, griseo-pubescentibus.

Borneo.

Dull blackish-brown, lower part of the face and cheeks, and spot behind the eye greyish; prothorax gibbous on each side, the

median line with four or five small tubercles and several minute granules on each; elytra rather short, coarsely punctured, the humeral angle produced, with a few granulations at its side, and between it and the scutellum two strong spines, the basal half and apical third with a greyish pubescence, the intermediate portion forming a sort of band; beneath and two first tarsal joints varied with grey.

In this species the male has the little apical knob at the sixth joint; in *G. reticulata* and *tessellata* it is at the seventh; in *G. corallina* it is not present.

Meton granulicollis.

M. piceus, griseo-pubescens; prothorace lateribus minute spinosis, antice utrinque granulatis, fusco-bivittato; elytris fusco-maculatis, apicem versus griseo-fasciatis.

Aru.

Pitchy, with a greyish pubescence, a broad dark stripe behind the eye and along the side of the prothorax, which has a small lateral spine and many small granulations at the side in front; elytra rather narrow, tuberous and granulated at the base, spotted with dark brown, a pale greyish band towards the apex; first and second joints of the antennæ, lower part of the tibiæ, last tarsal joint and claws black; palpi testaceous; beneath with a greyish pile; antennæ nearly twice as long as the body.

Length $5\frac{1}{2}$ lines.

This new genus, which differs from *Monohammus* in its clavate femora, will be described in a future part.

Monohammus commixtus.

C. griseo-brunneus; capite prothoraceque obscure nigro-vittatis; elytris singulis plagis lateralibus obliquis, albidis, irregulariter nigro-marginatis.

Ceylon.

Greyish-brown, approaching to fawn colour; head and prothorax obscurely striped with black, the latter sharply spined at the side; elytra sparingly and coarsely punctured, biapiculate, with two oblique white patches on the outer margin irregularly bounded above and below with dull black blotches and spots; antennæ dark-brown (last joint wanting).

The mesosternum is strongly produced, but the habit is that of *Monohammus*.

Cereopsius patronus.

C. fuscus ; capite prothoraceque lineis obscure ochraceis ornatis ; scutello fulvo ; elytris albis, tertio basali et plagâ laterali pone medium, fuscis ; antennis longissimis.

Ceylon.

Brown, densely pubescent ; prothorax strongly spined, and with the head variously marked with dull ochreous lines ; elytra strongly crested at the base, the shoulders produced, the basal third and a large external sub-triangular patch below the middle (the former slightly varied with ochreous) dark-brown, the remainder of the elytra nearly a pure white ; scutellum fulvous ; legs and underneath a pale ochreous brown ; antennæ very long.

Length 9 lines.

The specimen wants the three last joints of the antennæ, what remains is about twice the length of the body.

Cereopsius histrio.

C. niger ; capite prothoraceque vittis, elytris maculis albis, ornatis, his fortiter biapiculatis.

Aru.

Black, with lines and patches of white hairs ; front and cheeks white ; on the prothorax five longitudinal stripes ; each elytron with two principal spots, one before—the other behind—the middle, with a few smaller ones interspersed, all very distinct ; antennæ with the base of the third and fourth joints, and nearly the whole of the sixth, white ; legs varied ; under surface at the sides spotted with white.

Length 4 lines.

Ostedes.

Head broad, elongate behind ; face very short ; eyes large, lateral, emarginate ; mandibles small ; labrum narrow, entire, elongate ; palpi slender, pointed ; antennæ distant, longer than the body, setaceous, the first joint moderate, the third and fourth longest ; prothorax longer than wide, rough, the sides armed ; elytra scarcely wider than the thorax, narrowed towards the apex ; legs rather slender ; femora clavate, the anterior and intermediate coxæ large, the first tarsal joint elongate.

I am not satisfied as to the affinities of this insect. Its habit suggests *Monohammus*—*M. proletarius* for example—but the elongated tarsi are not usual among that portion of the *Lamiidæ ;* it has, moreover, a strong resemblance to some of the *Cerambycidæ*. A second species is found in Amboyna.

Ostedes pauperata. (Pl. II. fig. 1.)

O. brunneo-picea, hirsutula ; prothorace quadrituberculato ; elytris basi plumiferis, canis, lateribus fusco-variis.

Aru.

Reddish brown, inclining to pitchy, more or less furnished with short setulose black hairs ; prothorax with a stout tubercle at the side, and two smaller ones on the disc ; elytra remotely punctured, slightly crested near the base, the crest crowned with a few stiff hairs, and abruptly divaricate and pointed at the apex, whitish grey, the sides with an irregular brown patch, and spotted with the same colour ; legs and beneath with a sparse cinereous pile ; femora varied with grey and brown, lower half of the tibiæ, and three last tarsal joints, dark brown ; pro- and mesosterna simple.

Length 6 lines.

Cacia triloba.

C. picea, parce pubescens ; prothorace vittis quinque, scutello elytrisque maculis, subfasciatis dispositis, flavis, maculâ communi basali trilobâ ; antennis nigris, articulo quarto basi albo ; pedibus variegatis.

Ceylon.

Pitchy black, covered with a thin greyish pubescence, with stripes and spots of pale fulvous yellow ; prothorax with a central and two lateral lines ; elytra sparingly punctured, with an irregular spot, resembling the letter M, at the shoulder, a trilobed patch, common to both, at the scutellum, and two bands below, formed each by a double line of spots more or less distinct ; antennæ shorter than the body, black, basal half of the fourth joint dull white ; legs and beneath yellowish, varied with dark brown.

Length 7 lines.

Olenocamptus clarus.

O. ater, pube niveâ densissime tectus ; capite, prothorace, elytrisque maculis atris ornatis ; pedibus brunneis ; antennis testaceis, articulis tertió quartôque scabris.

China Borealis.

Black, covered with a very dense snowy-white pubescence, and spotted with black ; on the head, one spot behind the eye and five posteriorly on the prothorax (two, sometimes united, on the median line, and two or three at the side), and on each elytron three placed longitudinally ; legs light brown, sparingly pubescent ; antennæ

testaceous, the third and fourth joints scabrous; beneath with a black spot on the side of each abdominal segment.

Length 5—7 lines.

Differs from all the other species of this genus in the simple, not corrugated prothorax.

Callia chrysomelina.

C. sub-depressa, purpureo-cerulæa; capite, thorace, antennarum articulo primo basi, femoribusque (apice excepto) luteis, reliquis (antennis pedibusque) nigris.

Para.

Rather depressed; head, thorax, first joint of the antennæ at the base, and femora, except at the apex (in the post-femora almost entirely), luteous yellow; elytra rather broad, thickly punctured, purplish blue, clothed with short stiff obliquely-set black hairs; rest of antennæ, legs, and points of the mandibles, black; abdomen beneath steel blue.

Length $4\frac{1}{2}$ lines.

Serville is probably in error in describing the eyes of this genus as being entire; they are very deeply and decidedly emarginated in this and other species which I have examined.

Iolea proxima.

I. rufo-testacea; oculis mandibulisque nigris; antennis longis, articulo quarto apice, et sequentibus fuscis.

Ceylon.

Reddish testaceous, sparingly pubescent; eyes and mandibles black; antennæ twice the length of the body, the fourth joint at the apex, and remainder blackish brown.

Length 4 lines.

Near *I. prolata*, but the prothorax narrower, and the elytra wider and less pubescent.

Iolea histrio.

I. fusca, pubescens; prothorace duabus, elytris basi et maculis utrinque duabus (quarum unâ peramplâ) apiceque fulvis; subtus pedibusque testaceis; metathorace lateribus maculâ nigrâ lunari ornato.

Ceylon.

Coarsely pubescent, dark brown, becoming gradually lighter posteriorly; prothorax and elytra with well-defined fulvous

yellow patches, one on each side of the former, and on the latter one very large at the base, and another nearly as large and somewhat oblique rather below the middle, and in each case uniting at the suture with its fellow, between these a smaller spot, and another, crescent-shaped, near the apex; body beneath, and legs testaceous; a black lunar mark on each side of the metathorax; antennæ fulvous, with the two first and tips of the other joints black.

Length 4½ lines.

Differs in coloration from all others in this genus.

Astathes externa.

A. flava, nitida; elytris vix carinatis, subtilissime punctatis, plagâ exteriori sub-humerali, violacea; metathorace maculâ magnâ laterali, nigricante.

India.

Pale yellow, head and prothorax darker; elytra with a very faint trace of two carinæ very minutely punctured, and towards the shoulder externally a large rich violet patch; antennæ darker at the apex; metathorax with a blackish spot on each side; eyes and mandibles black.

Length 6 lines.

Besides colour, &c., differs from *A. splendida* in its minute punctuation.

Astathes decipiens.

A. flava, nitida; elytris quadricarinatis vix punctatis, dimidio basali violaceis; metathorace lateribus oculisque nigris, his, parte inferiori, rotundatis.

Sumatra.

Pale yellow, inclining to orange on the head and prothorax; elytra with short stiff hairs, scarcely punctate, except at the base, with four raised lines, the two nearest the suture strongly marked, the basal half rich violet; side of the metathorax with a blackish patch; antennæ with the four last joints, mandibles, and eyes black, the latter having the inferior portion round.

Length 6 lines.

Closely allied to *A. splendida*, F., but rather broader, the elytra almost free from punctures, except at the base, the hairs coarser, the raised lines more strongly developed, and the lower portion of the eye almost perfectly round; in *A. splendida*, too, the antennæ are darker to a much greater extent.

Astathes divisa.

A. flavo-aurantiaca, nitida; elytris bicarinatis, reticulato-punctatis, parte basali (suturo excepto) violaceis; tibiis apice, tarsisque, fuscatis.

India.

Dark orange yellow, lighter beneath; elytra with two strongly raised lines, and near the external margin a slight trace of another, hairy, punctured, the punctures towards the apex very large and having a reticulated appearance, the basal half rich violet, not extending, however, to the suture; antennæ with the eight last joints testaceous, darker towards the apex; lower part of the tibiæ and tarsi brownish; eyes and mandibles black.

Length 6½ lines.

This is also allied to *A. splendida*, F., but the punctuation has the reticulated character of *A. nitens*, F. *A. Daldorfii*, Ill. (Wiedemann, Arch. für Zoologie, iv. p. 136) certainly includes three species, of which this, or *A. splendida*, may be one.

Notolophia dispersa.

N. picea, dense griseo-tomentosa, parce hirsuta; prothorace bituberculato; elytris basi cristatis, fusco-variis, apice rotundatis.

Australia Borealis.

Pitchy, covered with a short thick woolly whitish grey pubescence, with several slender nearly erect hairs scattered over every part of the insect, black on the upper parts, but white at the sides and on the antennæ and legs; prothorax with two tubercles in the middle; elytra sparingly punctured at the base, a plumose crest between the shoulder and scutellum, a large brown patch behind the shoulder inclosing the crest, and a crescent-shaped line below the middle of the same colour, the grey above this being of a lighter shade than elsewhere; antennæ rather short, dark brown, obscurely annulated with grey; base of the palpi testaceous, last joints and mandibles pitchy; eyes black. British Museum.

Length 5 lines.

Notolophia variabilis.

N. picea, pubescens, fusco griseoque-varia; prothorace integro; elytris singulis tricristatis (unâ basali, alteris pone medium) apice truncatis.

Aru.

Pitchy, with a short dense pubescence, varying from pale grey

to different shades of brown, the colouring much less distinct in some individuals than in others; prothorax rather transverse, convex, quite entire; each elytron with two raised lines, on the innermost of which are seated three crests, one at the base, one directly behind the middle, and the third on the declivity towards the apex, the first of these crowned with short hairs, apex truncate; palpi testaceous.

Length 5 lines.

There are four other species of this genus from Aru in Mr. Wallace's private collection.

Sthenias Bondii.

S. pubescens, roseo-griseus; capite, prothorace, elytrisque basi, fusco-vittatis, his fasciâ mediânâ triangulari (apice scutellum versus) tarsisque fuscis.

India.

Pubescent, greyish with a delicate rose-coloured tint; stripes over the head, thorax, and basal third of the elytra brownish, the first begins over and between the eyes, and as it passes to the elytron divides into two, the other at the side expands on the shoulder into a broad patch, below this and with the apex towards the scutellum, a triangular brownish band; tarsi brown.

Length 8 lines.

Dedicated to Frederick Bond, Esq., one of our members, to whom I am indebted for this and many other interesting insects.

PHEMONE.

Head rather large; eyes small, emarginate; palpi elongate, slender, acuminate; labrum produced, narrower anteriorly, covering the mandibles; antennæ setaceous, longer than the body in the male, the third joint longest, the rest gradually decreasing; prothorax broader behind; elytra depressed; legs robust, tarsi with the three first joints short and very broad in both sexes; pro- and mesosterna produced.

Proposed for my *Apomecyna frenata* (Trans. Ent. Soc. N.S. iv. p. 107), a species which, from its antennæ, tarsi and other characters, cannot be retained in that genus.

Phemone frenata. (Pl. II. fig. 5.)

ATHEMISTUS.

Head rather small, the front broad, quadrate, smooth ; antennæ distant, shorter than the body, the third joint longest ; eyes small, deeply emarginate, embracing the base of the antennæ ; labrum short ; palpi long, slender, acuminate ; prothorax irregular, subquadrate, spined at the side ; elytra convex, somewhat compressed, broadest at the middle ; legs moderate ; femora subclavate ; tibiæ simple ; tarsi not dilated, the first joint of the posterior longer than the rest ; pro- and mesosterna not produced.

The type of this genus is *Parmena rugosula*, Guér. *Microtragus*, White, its nearest ally, differs in its approximate antennæ, nearly entire eye, narrow and rounded front, and obliquely deflexed occiput.

Apomecyna nigrita.

A. fusca, opaca ; capitis fronte bigibbosis ; prothorace confertim, elytris fortiter punctatis, his basi subcristatis, apice emarginatis, utrinque plagis duabus obsoletis.

Australia Borealis.

Dark brown, opaque ; two raised points between the eyes ; prothorax thickly punctured, slightly narrowed behind ; elytra coarsely punctured, the base slightly crested, the apex emarginate, the outer angle pointed, and having on each, laterally, two large almost obsolete patches ; the antennæ are not perfect, but appear to be rather longer than is usual in this genus. British Museum.

Length 5 lines.

The insect resembles a worn specimen of *A. histrio*, F.

Hathlia grammica.

H. obscure albo-pubescens ; capite, prothoraceque grisescente nebulosis, hoc rude punctatis ; elytris lineis angustis griseis, longitudinaliter dispositis.

Australia Borealis.

Pubescent, dull white ; head and prothorax obscurely clouded with greyish, the latter coarsely but not closely punctured, and as broad behind as the base of the elytra ; scutellum very transverse ; elytra slightly punctured, principally at the base, broadest in the middle and having each about six narrow longitudinal greyish brown lines, but not quite reaching to the apex, which is rather abruptly pointed ; antennæ darker towards the end ; the legs and underneath of a dirty white ; mandibles and eyes black. British Museum.

Length 8 lines.

Hathlia murina.

H. pallide-murina pubescens; prothorace vix punctato; elytris parce punctatis, pilis elongatis aspersis.

Australia Borealis.

Pubescent, pale yellowish grey; head with a depressed line between the eyes; prothorax broadest posteriorly, scarcely punctured; elytra sparingly punctured, with two indistinct lines on each, the sides rather lighter in colour; under surface and legs dull white; antennæ darker towards the end, and annulated with grey. British Museum.

Length 5 lines.

Mr. Thomson proposes to substitute *Myccrinus* for *Hathlia*, which he says has been previously used for a genus of *Lamellicornes:* but *Athlia* is, I think, the word referred to. The genus has, hitherto, been found in Australia in the north only, but it occurs also in India and in Senegal.

Hathlia procera.

H. elongata, grisea; prothorace rugoso, subcylindrico; elytris parallelis, basi confertim, postice seriatim punctatis, obscure albo-nigroque variegatis, apice truncato; antennis setaceis, corpore longioribus.

Ceylon.

Elongate, greyish; prothorax subcylindrical, rough, with coarse punctures; elytra parallel for about three quarters of their length, cylindrical, thickly punctured at the base, the punctures in rows towards the apex, which is truncate, the surface obscurely varied with black and white, behind the middle a larger patch, principally white predominating; scutellum transverse; antennæ setaceous, longer than the body.

Length 6½ lines.

The habit is somewhat different from the true *Hathlicæ*, and in some respects approaching *Ropica*. The true distinction between *Hathlia* and *Apomecyna* appears to be in the antennæ, which in the former are setaceous, and as long or longer than the body, whilst in the latter they are very short, and after the first joint of nearly equal thickness throughout, but in neither genus are the species homogeneous.

Ropica incana.

R. sub-depressa, canescente-tomentosa; elytris seriatim punctatis, singulis plagâ fuscâ, apicem versus, ornatis.

Aru.

Rather depressed, pitchy brown, covered with a very pale grey tomentose pubescence; prothorax narrower in front, finely punctured; elytra regularly punctured, each with a dark brown oblique sub-apical patch, nearly meeting at the suture.

Length 5 lines.

Ropica stigmatica.

R. sub-depressa, fusca, obsolete griseo-vittata; elytris seriatim punctatis, plagâ sub-medianâ communi griseâ, maculisque duabus albis; antennis, palpis, pedibusque ferrugineis.

Aru.

Rather depressed, dark brown, with faint greyish interrupted irregular stripes; prothorax sparingly punctured; elytra with the punctures in rows, a large pale greyish blotch at about the middle, extending towards the apex, and common to both, in which on each side are two white spots; beneath dark brown or black, with a sparse greyish pile; antennæ, palpi, and legs dull ferruginous.

Length 3 lines.

Ropica varipennis.

R. fusca, disperse punctata, griseo-variegata; elytris basi tertiaque terminali pallide fulvis, hac maculâ semicirculari albâ ornatâ, disco ante medium cinereo; antennis annulatis.

Aru.

Dark brown, with a short greyish pubescence, varied with cinereous and buff; prothorax rather short, finely punctured, dull cinereous; elytra more coarsely punctured, greyish, with the base buff, the middle occupied by a cinereous patch and rather more of the terminal third buff again, within this a semicircle of pure white, below which, and also at the lines where the buff meets the grey, chocolate brown; beneath greyish brown; mandibles and palpi pitchy.

Length $2\frac{1}{2}$ lines.

Ropica præusta.

R. griseo-fusca; prothorace disco, lateribusque infra, subseriatim punctato; elytris acuminatis, rude punctatis, maculâ exteriori, ante apicem, piceâ.

Ceylon.

Greyish brown; head and prothorax roughly punctured, in the latter in four principal rows, with several others crowded irre-

gularly beneath at the sides; elytra acuminate, rather depressed, coarsely punctured in rows, with a pitchy oblong oval spot at the outer margin near the apex.

Length 4 lines.

Colobothea longimana.

C. obscure-cervina, fulvo-nigroque varia; antennis pedibusque fuscis, pro-femoribus pro-tibiisque longissimis, his intus spinulosis.

Brasilia (Espiritu Santo).

Dull cervine, with an obscure mingling of fulvous and black spots and patches; on the prothorax the fulvous very slight, four black spots on its disc and three or four more on each side; on the elytra the black assumes somewhat the form of three irregular and interrupted bands, more or less bordered with fulvous; beneath with a greyish pubescence; legs and antennæ dark brown, the latter with its joints slightly annulated with cinereous; pro-femora and pro-tibiæ very long, the latter with eight or nine small spines beneath; humeral angle produced.

Length $6\frac{1}{2}$ lines.

This is a remarkable species, and might be, perhaps, considered the type of a new genus.

Colobothea Fryi.

C. atra; capite supra, prothorace, elytrisque vittis duabus albis communibus apicem versus ad fasciam connexis; antennarum articulo sexto annulato.

Para.

Rather narrow, black; a white line in front, which on the top of the head divides into two, and, passing over the thorax and elytra, unite by two or three slight branches with each other and with a fascia near the apex, which has a fringe of the same colour; under surface with a greyish pubescence, and having a broad white stripe extending from below the eye to the fourth abdominal segment, the seventh being entirely black; two first joints of the middle and posterior tarsi cinereous; basal half or more of the sixth antennal joint white.

Length $8\frac{1}{2}$ lines.

This well-marked and handsome insect is dedicated to Alexander Fry, Esq., F.L.S., &c., who has made an unusually fine collection of Brazilian insects of all orders, at Rio. To him I owe my earliest specimens, which, having contributed to relieve the monotony of a long voyage, gave me a first taste for Entomology.

Colobothea luctuosa.

C. nigra; capite vittis tribus, prothorace quinque, elytris singulis duabus, unâ humerali, alterâ medio-suturali, ochraceis, his fasciâ apicali, maculâ, tertiâ terminali, antennarum articulis quarto sextoque basi, albis.

Para.

Dull black, a pale ochreous stripe from the top of the head over the prothorax, and another on each side which extends over the third of the elytra, between the latter and towards the apex a fine line of the same colour close to the suture, the apex and spot between it and the outer stripe white; side of the prothorax and mesothorax dull white; abdomen, except the two last segments, greyish; fourth and sixth antennal joints white at the base.

Length 4½ lines.

Anomœsia dolosa.

A. picea, pubescens, obscure-cinerea, griseo-fuscoque variegata; antennis subannulatis.

Natal.

Pitchy, with a dense pale cinereous pubescence, obscurely varied with greyish and brown; antennæ with the three first joints and the upper half of the remainder pale brown.

Length 4 lines.

In the description of this genus (Trans. Ent. Soc., N. S., iv. p. 255) I omitted to mention the slight projection at the side of the prothorax, which is rather exaggerated in the figure, and is even less evident in this species.

Saperda funesta.

M. picea, punctata, disperse hirsuta, griseo-irrorata; antennis sub-annulatis.

Australia (Adelaide).

Pitchy, inclining to olivaceous black, with a few short stiff hairs and small greyish spots scattered over the upper surface, but principally confined to the elytra, which are thickly and coarsely punctured; antennæ with the fourth, fifth and sixth joints with an obscure greyish ring at their bases; front of the head and under part greyish.

Length 4 lines.

Allied to *Saperda paulla*, Germ.

Amphionycha circumcincta.

A. hirsuta, pallide straminea ; capite prothoraceque supra, elytris basi, discoque chalybeo-nigris ; antennis pedibusque fusco-variis.

Flumen Amazon.

Rather short, hairy, pale straw yellow, with the upper part of the head and prothorax, scutellum, base, and nearly the whole of the elytra, except the pale yellow, which forms a complete border around them, dark chalybeate blue ; eyes, tips of the mandibles, stripe on the upper edge of all the femora, tibiæ and tarsi, a stripe also on the first antennal joint, the second and third, except a small line below, and the whole of the seventh to the eleventh, dark brown.

Length 4 lines.

The elytra of this remarkable species are bent at the sides as in *Hemilophus*.

Glenea scapifera.

G. fulvo-pubescens ; prothorace vittis sextis, elytris utriusque maculis quatuor, antennisque nigris ; pedibus testaceis ; abdomine pallido, nigro-maculato.

Ceylon.

Yellowish brown, with a lighter pubescence ; prothorax with six longitudinal stripes ; elytra with one at the base and three larger rounded spots on each, and antennæ black ; legs testaceous ; abdomen pale, spotted with black at the sides.

Length 5 lines.

Near *G. quatuordecim-maculata*, Hope.

Glenea commissa.

G. nigro-chalybeata, nitida, vittâ communi medianâ, prothorace vittâ utrinque, elytrisque duabus lateralibus albis.

Ceylon.

Shining steel black ; a white hairy stripe, arising from under each eye and uniting above, is continued over the prothorax and along the suture to the apex of the elytra, another on each side of the prothorax, and two at the side of each elytron ; under surface pure white, with a stripe on each side of the thorax, and spots on the abdomen steel black.

Length 7 lines.

Pachypeza simplex.

P. sub-linearis, fusco-brunnea, punctata; elytris singulis vittâ griseâ obliquâ ornatis; antennis simplicibus.

Para.

Narrow, the sides nearly parallel, except at the shoulder, moderately punctured; prothorax quadrate; elytra with one long oblique pale greyish stripe, extending from the shoulder to the suture near the apex; antennæ not hairy, the third, fourth and fifth joints nearly equal.

Length 5 lines.

The antennæ are rather more distant at the base than in *P. pennicornis*, Germ., to which it is allied.

ESMIA.

Head short in front; eyes lateral, slightly emarginate; palpi unequal, slender, the terminal joint pointed; antennæ approximate, longer than the body, the first four joints very hairy and much longer than the rest together; prothorax unarmed, elongate, narrow, the sides nearly parallel; elytra moderate, wider than the thorax, rounded at the apex; legs moderate, with the three first tarsal joints short; mesosternum bilobed posteriorly.

Pachypeza, the nearest ally of this genus, differs in its shorter (comparatively) and very robust legs, and in the antennæ, which are of the normal character; the eyes, too, are larger and more frontal, and the head much deeper. In the species now to be described, the first four joints of the antennæ are twice the length of the remainder.

Esmia turbata. (Pl. II. fig. 8.)

E. fusca, hirsutula, maculis elongatis, citrinis ornata; antennarum articulo quarto fulvo-annulatis; corpore infra, pedibusque pallidis.

Para.

Pubescent, brown, with long scattered hairs and various elongate spots of a pale lemon yellow on the upper surface, especially a line from the vertex over the prothorax and along the suture, interrupted in the middle of the elytra, and terminating in a patch of the same colour at the apex; upper part of the fourth antennal joint, tarsi, face, cheeks and under surface pale yellowish.

Length 4 lines.

Whilst these sheets were passing through the press we received the new species from Australia described below. The first five were collected by Mr. Bakewell, at Melbourne; the remainder were sent from Moreton Bay by Mr. Diggles.

Mecynopus semivitreus.

M. ferrugineus; elytris postice sub-divergentibus, nitidis, maculis duabus elongatis, testaceis; femorum basi, tarsisque posticis albis.

Melbourne.

Ferruginous; head rather coarsely, prothorax more finely and closely punctured, the latter sub-cylindrical, its disc with five very slight tubercles; elytra broadest at the shoulder, slightly contracted beyond the middle, diverging a little posteriorly, each with two large, longitudinal, glassy, testaceous spots; bases of the femora and posterior tarsi white.

Length 4½ lines.

The type of this genus is from Tasmania (*M. cothurnatus*, Er.).

Tritocosmia paradoxa.

T. atra, opaca; elytris rubris; antennarum articulis primis tertiisque elongatis, valde clavatis, reliquis brevissimis.

Melbourne.

Black, opaque; prothorax finely corrugated, with four slight tubercles on its disc, the side bluntly toothed, anterior and posterior margins pale reddish; elytra pure red, tricostulate, the interstices finely punctured; antennæ longer than the body, the first and third joints very long and much enlarged at their tips, the last eight together not longer than the third; eyes pale; tibiæ and tarsi tinged with red.

Length 5 lines.

I have seen two specimens of this singular insect, which is allied to *T. Roci*, Hope.

Ischnotes Bakewellii.

I. nigrescens; prothorace subtilissime punctato, lateribus concavis; elytris brunneis, creberrime punctatis.

Blackish brown; head rather narrower than the prothorax, with a raised line between the eyes, antennæ much shorter than the body, the first joint pitchy; prothorax minutely punctured, two-thirds the length of the elytra, somewhat broader anteriorly, the

sides slightly concave; elytra narrow, parallel, brownish, thickly but rather coarsely punctured; legs short, rufous brown; abdomen paler, with greyish hairs.

Length 6 lines.

Omotes erosicollis.

O. testaceus; prothorace rotundato, depresso, subtilissime punctato, medio eroso; elytris fortiter punctatis.

Melbourne.

Testaceous; head small, very roughly punctate; prothorax rounded, depressed, very finely punctured, scarcely longer than broad, narrower anteriorly, the disc with a large shining erose, coarsely punctured patch; elytra parallel, with large closely set punctures, having a short stiff hair arising from the base of each; abdomen smooth, with the three first segments pitchy.

Length 4½ lines.

Pempsamacra vestita.

P. brunnea, squamis griseo-argenteis; antennis brevibus, subclavatis, fuscis, articulo quinque (apice exceptâ) albo; elytris maculâ mediana fuscâ apice subrotundatâ.

Melbourne.

Brownish yellow, covered with silvery grey scales; head nearly as wide as the thorax; eyes rather small, deeply divided, black; antennæ short, the last six joints much shorter and thicker than the rest, the fifth white, except at the apex; prothorax longer than wide, with an impressed line in the middle; elytra depressed, the angle formed by the depression terminating posteriorly in a prominent tuberosity, the apex sub-truncate, a chestnut brown spot in the middle of each; beneath silvery white.

Length 5 lines.

Lepidisia bimaculata, White, is *Pempsamacra pygmæa*, Newman.

DIOTIMA.

Head small, expanded behind the eyes, which are large, oblong, and nearly entire, labrum nearly covering the strongly curved mandibles; maxillary palpi very long, the last joint dilated, truncate; antennæ short, setaceous, the third joint longest. Prothorax small, subquadrate, irregular. Elytra long, parallel, depressed, rounded at the apex. Legs slender, coxæ of the middle and anterior legs conical, approximate, their tibiæ spined at the end; tarsi narrow, the first joint lengthened.

This genus seems to belong to the *Cerambycini*, although there are certain points which suggest an affinity to the *Lepturidæ*. I have seen a male without antennæ; the description is from a female.

Diotima undulata. (Pl. II. fig. 9.)

D. fusca, subsericeo-pubescens; elytris fasciis tribus undulatis olivaceo-testaceis.

Moreton Bay.

Dark brown, with a silky pubescence, underneath paler; head small, narrower than the prothorax, which is slightly constricted anteriorly and bulging out at the side; elytra broader than the prothorax, tricostulate, projecting forwards at the shoulder, with three zigzag brownish testaceous bands—the first basal, varied and indistinct, the second in the middle, the third near the apex; legs slender; scutellum small, triangular; abdomen soft.

Length 16 lines (♀).

Psilomorpha apicalis.

P. elongata, rufo-aurantiaca; abdomine, oculis, antennis, pedibusque nigris; elytris apice chalybeatis.

Moreton Bay.

Elongate, slender, reddish orange; abdomen, eyes, antennæ, palpi and legs black; prothorax twice as long as wide; elytra with three delicate costæ, the interstices very finely punctured; apex chalybeate blue.

Length 5 lines.

Rhagiomorpha exilis.

R. ferrugineo-brunnea; prothorace lateribus sub-dentatis; elytris albo-bilineatis; antennarum articulo tertio apice nigro-fasciculato.

Moreton Bay.

Elongate, rusty brown; head minutely punctured, with a broad dark brown front; prothorax finely corrugated, slightly toothed at the side; elytra narrow, tapering, with two lines of white hairs; antennæ a little longer than the body, the hind joint with a tuft of black hairs at the tip; underneath silvery white.

Length 6 lines.

The head is broader and the femora less clavate than in *R. lepturoides*.

Tritocosmia Digglesii.

T. atra, nitida; elytris, femoribus anticis mediisque, rubro-aurantiacis, illis apice chalybeatis.

Moreton Bay.

Deep glossy black, but the abdomen with a blueish tinge; elytra, fore and middle femora rich reddish orange, the former with four costæ, the interstices very closely and minutely punc-

tured, the apex chalybeate blue; prothorax with two tubercles on its disc, with short thickset hairs, not always present however; antennæ sparingly pilose, the fifth and following joints dilated on one side; third anterior tarsal joint narrower than the second.

Length 11 lines.

The tuft on the third antennal joint, which is supposed to characterise this genus, is deciduous.

Temnosternus dissimilis.

T. piceus, fulvescente-pubescens; prothorace fortiter punctato, transverso, utrinque dentato; elytris latioribus, medio-carinatis, acuminatis, profunde punctatis, albo-fuscoque variegatis.

Moreton Bay.

Dark brown, with a close fulvous pubescence; head greyish white in front; prothorax transverse, strongly punctured, with a broad, smooth, elevated, longitudinal line; elytra broader than the thorax, coarsely punctured, keeled along the back, acuminate at the apex, the sides at about the middle having a large brown patch, bordered, except at the external margin, with white and shading off into yellowish posteriorly, with a few spots of white again; antennæ, legs and body beneath greyish; middle of the abdomen pitchy.

Length 7 lines.

Meton Digglesii.

M. fuscus, grisescente-tomentosus; prothorace lateribus fortiter spinosis, fusco-bivittato; elytris apice maculâ subocellatâ ornatis.

Moreton Bay.

Dark brown, with a dense pale yellowish grey pile; a broad dark stripe behind the eye and along the sides of the prothorax, which has a strong lateral spine; scutellum small, rounded; elytra much wider than the thorax, tuberous and granulated at the base, smoky brown, darker towards the middle posteriorly, with a large comma-shaped spot having a clear yellowish grey border; lower third of the tibiæ and tarsi varied with black.

Length 8 lines.

Symphyletes cinnamomeus.

S. fuscus, cinereo-pubescens, luteo-irroratus; prothorace punctato, disco tuberculis duobus; elytris basi bicristatis, granulatis, apice bidentatis, fasciâ curvatâ humerali brunneâ, alterâ latâ apicali.

Moreton Bay.

Dark brown, covered with short cinereous hairs and thickly sprinkled with small reddish yellow spots; front of the head and prothorax with large scattered punctures; elytra sparingly punctured and granulated, the shoulders much produced, with two crests, the outer formed by three large granules, the inner larger and more tuberous, the two placed in a large brown curved band passing behind the scutellum, and behind the middle another band or patch, much broader and paler, and extending to the apex; eyes and mandibles black; beneath pale brown.

Length 11 lines.

Rhytiphora polymita.

R. nigro-picea, tomento rufo alboque varia; elytris punctis granulisque atris dispersis.

Moreton Bay.

Pitchy black, densely covered with short white hairs variously mingled with red or dark orange; head with a few rough punctures between the eyes; prothorax short, slightly corrugated and obscurely banded with red; elytra with small black granulations on the basal half and somewhat impressed spots on the remainder, both invariably placed among the white portion of the colours, and between which the red is intricately mingled; antennæ sprinkled with black, the tips of the joints more or less of the same colour; legs and undersurface clouded with red; mesosternum quadrate, scarcely emarginate.

Length 14 lines.

Rhytiphora cretata.

R. nigro-picea, pube subtilissimâ tecta, lineis plagisque albo-varia; infra albo-tomentosa.

Moreton Bay.

Pitchy black, scarcely pubescent; head nearly smooth, a white patch on the cheek; prothorax corrugated, with two principal lines of white; elytra irregularly punctured, with a few granulations at the base, and remotely blotched and spotted with white—one blotch at the side below the shoulder, behind the middle four or five patches forming a sort of oblique band, and towards the apex two or three more but less distinct, at the base and along the suture several spots—all formed by densely set, short, white hairs; antennæ annulated with white; femora and beneath densely tomentose, white, sprinkled with black; tibiæ with a reddish tinge; mesosternum deeply emarginate posteriorly.

Length 13 lines.

Ropica Exocentroides.

R. pallide fuscescens; prothoracis disco, scutelloque nigris; elytris basi tuberosis, fusco-nebulosis, tertiâ terminali pallidâ, maculâ fuscâ communi maculisque duabus albis.

Moreton Bay.

Pale greyish brown; middle of the prothorax and scutellum black; elytra irregularly punctured, tuberous at the base, clouded behind the middle, the terminal third pale, with two white spots on each and a dark brown one common to both; antennæ annulated; posterior femora pale tawny.

Length 3 lines.

Allied to *R. variipennis* from Aru.

Microtragus Amycteroides.

M. obscuro-niger; prothorace ampliato, tuberculato, utrinque spinoso; elytris rugoso-punctatis, tuberculorum seriebus duabus tertia terminali vix attingentibus.

Moreton Bay.

Dull black; head very oblique above the eyes; antennæ about two-thirds the length of the body; prothorax large, broadest in the middle, strongly toothed at the side, and very roughly and irregularly tuberculate; scutellum very small; elytra convex, sparingly but coarsely punctured, each with two rows of stout prominent tubercles—external row with eight, the inner with six and one at the shoulder, scarcely extending the apical third; mesosternum narrower posteriorly, and slightly emarginate.

Length 10 lines.

DESCRIPTION OF THE FIGURES, PLATE II.

Fig. 1. *Ostedes pauperata.*
2. *Eroschema Poweri.*
3. *Oxylymma lepida.*
4. *Collyrodes Lacordairei.*
5. *Phemone frenata.*
6. *Dysthæta anomala.*
7. *Thranius bimaculatus.*
8. *Esmia turbata.*
9. *Diotima undulata.*

Note.—At page 14, line 1, substitute *Aspidomorpha* for *Coptocycla*. *Stenoderus labiatus* (page 24) is identical with Kirby's *S. Ceramboides*, and this again is certainly only a variety of Olivier's *S. suturalis*. Mr. Thomson's genus *Nitocris* (Arch. Ent. Pt. 15, p. 198) corresponds to my *Dirphya* (ante, vol. iv. p. 262, published the 5th April, 1858). The 15th part of the "Archives" had not appeared up to the first of June in the same year.

III. *A Monograph of the Genus* Adolias, *a Genus of Diurnal* Lepidoptera *belonging to the Family* Nymphalidæ. *By* Frederic Moore, Esq., Assist. Museum, Hon. East Ind. Company.

[Read Oct. 5th, 1857.]

Being engaged upon the present genus in the compilation of a descriptive "Catalogue of the Lepidopterous Insects in the Museum of the Hon. East India Company," and knowing that many of the species of *Adolias* described by the earlier authors have not been thoroughly worked out, I have endeavoured in the following pages to supply descriptions of some of those which have, hitherto, been imperfectly identified, and also of the new species contained in the various collections in this country, viz., from the Collections of the British Museum, Hon. East India Company, Entomological Society of London, Hopean Collection at Oxford, W. W. Saunders, Esq., J. O. Westwood, Esq., and W. C. Hewitson, Esq., to whom my best thanks are due for the kindness in allowing their specimens to be described in the following monograph.

Genus Adolias, Boisduval.

Adolias, Boisd. Spec. Gén. Lép. Planches, p. 2, t. 3, f. 2 (1836); Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 289.

Aconthea, Horsfield, Catal. Lep. Mus. East India Comp. t. 8, f. 6 (1829).

Symphædra, *Euthalia*, *Cymothoë* (pt.), Hübner.

Nymphalis (pt.), Godart.

Itanus, E. Doubleday, MS. (1847).

1. *Adolias Aconthea*, Cramer.

♂ ♀ *Papilio Aconthea*, Cramer, Pap. Exot. ii. t. 134, f. D. E. ♂ F. G. ♀ (1779).

Nymphalis Aconthea, Godart, Enc. Méth. ix. p. 383.

Cymothoë Aconthea, Hübner, Verz. bek. Schmett. p. 39.

Adolias Aconthea, Boisduval, Spec. Gén. Lép. Planches, p. 2, t. 3, f. 2 (1836); E. Doubleday, List Lep. Brit. Mus. pt. i. p. 103; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 1.

♂ *Nymphalis Disconthea*, Godart, Enc. Méth. ix. p. 384 (1819).

Aconthea primaria, Horsfield, Catal. Lep. Mus. E. I. C. t. 8, f. 6 (1829).

Hab. Java.

In Collection of East India Company, British Museum, W. W. Saunders, Esq., W. C. Hewitson, Esq.

Adolias Aconthea.—Male. Upperside dark glossy olive brown: *fore-wing* with broad transverse indistinct band of irregular shaped spots, suffused anteriorly, and along the margins with black, the inner margin of these spots being convex, the outer zigzag, with the point inward; markings at the base of wing black: *hind-wing* with inner zigzag narrow dark band, and outer row of small black triangular spots; markings within discoidal cell black. Underside pale-brown, marked as above, but the *fore-wing* with the transverse band whitish, patch at apex of both wings whitish.

Female paler olive-brown: *fore-wing* with brownish white band, suffused with dark brown on costal margin: *hind-wing* with inner row of small brownish-white spots, and outer row of triangular black spots; base of wings with black marks. Underside pale brown, with band of fore-wing whitish; hind-wing with the inner row of whitish spots larger.

Expanse of male $2\frac{3}{8}$, female $2\frac{5}{8}$ inches.

The transformations of *Adolias Aconthea* are figured in the "Catalogue of the Lepidopterous Insects in the Museum of the East India Company," plate 6, fig. 1, 1 a, discovered in Java by Dr. Horsfield. Feeds on the Mango.

2. *Adolias Parta*, Moore. (Pl. III. fig. 1, ♂, ♀.)

Adolias Parta, n. sp.—Male. Upperside dark brown, with a vinaceous tinge: *fore-wing* with a paler transverse band, margined broadly on both sides with black, the anterior portion within, from costal margin on both sides, with a series of small white patches; marks within discoidal cell black, with dark brown centres: *hind-wing* with an inner blackish band and outer row of small black spots. Underside paler, marked as above.

Female. Upperside pale brown: *fore-wing* with broad whitish curved transverse band, with patch on costa and dark margins: *hind-wing* with rather broad inner band, and outer zigzag line, the point between each vein with a minute darker dot; space be-

tween inner band and base tinged with white; marks at base of wings blackish. Underside pale dull ochreous, with paler margins; markings as above, but very indistinct.

Expanse of male $2\frac{3}{8}$, female $2\frac{7}{8}$ inches.

Hab. Borneo.

In Museum East India House and W. W. Saunders, Esq.

3. Adolias Garuda, Moore. (Pl. III. fig. 2, ♂, ♀.)

Adolias Garuda, n. sp.—Male. Upperside glossy greenish-brown: *fore-wing* with costal margin to its middle, a broad irregular band from thence to posterior margin black, the latter bordered exteriorly, anteriorly from costal vein with five white spots (these spots being in some specimens more or less developed, and in others nearly or quite obsolete); two small white spots on costal margin, one-fourth from the apex; exterior margin and submarginal band blackish; within discoidal cell first a short line, then two reniform marks, black: *hind-wing* with curved dentate blackish band from middle of anterior margin to near abdominal margin; a submarginal row of small deep black spots; exterior margin near anal angle blackish; within discoidal cell some black markings, and two small black spots without, one above, the other below the cell. Underside light-chocolate-brown, greyish towards the base: *fore-wing* with black marks within discoidal cell as above, and a small black spot below it; the row of five white spots, and the two apical spots as above; from the latter across the disc to posterior margin runs a narrow interrupted black band; at the apex and along the exterior margin some bluish-grey spots: *hind-wing* with four lines within discoidal-cell, a small spot and two oval marks above, black; an indistinct band across the disc; submarginal row of black spots as above; a patch of bluish-grey at anterior angle. Female pale brown, with a greenish gloss. Upperside with markings as in male, but less defined; the row of white spots of the fore-wing are larger, and the submarginal row of black spots on the hind-wing are also larger than in the male. Underside as in that of the male, wings shaped as in *Adolias Aconthea*.

Expanse of male $2\frac{3}{8}$, female $2\frac{7}{8}$ inches.

Hab. N. et S. India, Ceylon.

In Collection of East India Company, British Museum, W. W. Saunders, Esq.; et W. C. Hewitson, Esq.

The transformations of *A. Garuda* are figured among the original drawings of General Hardwicke in the British Museum,

and are copied from these on plate 6, fig. 2, 2 a, of the East India Company's Catalogue of Lepidoptera. General Hardwicke states that it feeds on *Trophis aspera*, and on a species of *Bryonia*.

4. *Adolias Phemius*, E. Doubleday. (Pl. III. fig. 3, ♂, ♀.)

♂ *Itanus Phemius*, E. Doubleday, MS.

Adolias Phemius, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 13, t. 41, f. 4 (1850).

Hab. Darjeeling.

In Museum East India Company, British Museum.

Adolias Phemius.—Male. Upperside dark brown: *fore-wing* with indistinct black submarginal band, marks within discoidal cell, and two spots and large patch below the cell; a series of longitudinal narrow white lines tapering from costal margin near the apex to middle of wing: *hind-wing* with basal two-thirds blackish; from anal angle curving broadly upward to above middle of exterior margin light blue-green, the margin being white, and a black line along the extreme exterior margin, which is much dentated. Narrow ciliæ white. Underside dark brown, paler at the base: *fore-wing* with longitudinal white lines, discoidal marks and black sub-marginal band as above: *hind-wing* with black discoidal marks, indistinct blackish sub-marginal band; the bluish-green and white marginal band narrower, and with a small black spot at anal angle; extreme margin black, with narrow white ciliæ.

Female. Upperside olive-brown: *fore-wing* with black discoidal markings; the series of longitudinal white lines wider than in the male; transverse lines blackish; apex slightly suffused with white. Underside pale brownish-buff, greyish at the base; discoidal markings black; longitudinal whitish lines more confluent than above; apex of both wings tinged with white; transverse lines as above, but outer one on hind-wing composed of spots.

Expanse of male $2\frac{1}{2}$ inches, female $3\frac{1}{8}$ inches.

5. *Adolias Anosia*, Boisduval, MS. (Pl. V. fig. 1, ♂, ♀.)

Adolias Anosia, n. sp.—Male. Upperside dark ash-green, with the anterior margin of hind-wing broadly pinky-brown: *fore-wing* with broad transverse band of ashy-white irrorations; black markings within discoidal cell, and some below it bordered with ashy-white irrorations: *hind-wing* with ashy-white irrorations on lower part of the disc, bordering the discoidal marks, and a spot

above and below the cell, also bordering a sub-marginal row of black spots. Underside creamy-ash-colour, palest on the anterior half, which is covered with rather indistinct darker short transverse striæ, markings within and about discoidal cell black; on the hind-wing an indistinct sub-marginal row of black spots.

Female. Upperside paler ash-green than the male, exterior margins brownish; markings disposed the same: *fore-wing* with a curved row of five white spots from middle of costal margin; the irrorated band paler and more clearly defined; an indistinct inward oblique row of black spots from near apex to near middle of posterior margin: *hind-wing* with indistinct black curved band from middle of anterior to middle of abdominal margin, also an indistinct sub-marginal row of black spots. Underside paler than in the male, marked as upperside, with the curved row of five spots bordered inwardly with dark brown; the indistinct oblique row of blackish spots from apex only to middle of the disc, the lower part being suffused with dark brown; exterior margin dark brown; *hind-wing* with indistinct inner band and sub-marginal row of large dark brown spots. Anterior wing in both sexes much falcated.

Expanse of male $2\frac{1}{2}$, female 3 inches.

Hab. N. India.

In Museum East India Company.

6. *Adolias Alpheda*, Godart. (Pl. III. fig. 4, ♂, ♀.)

Nymphalus Alpheda, Godart, Enc. Méth. ix. p. 384 (1819).

Adolias Alpheda, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 20.

Hab. Java.

In Museum East India Company.

Adolias Alpheda may be distinguished by the male having the upperside dark olive green, with a pinky tinge broadly on anterior margin of hind-wing, and by the deep greenish grey of the underside, and having a greenish gloss over the anterior half of the wings; also an indistinct white patch at and near the apex. The female by the very broad whitish band of the upperside of the fore-wing, and by the glaucous white underside, and ochreous marking.

Expanse of male $2\frac{3}{8}$, female $2\frac{6}{8}$ inches.

7. *Adolias Adonia*, Cramer.

♀ *Papilio Adonia*, Cramer, Pap. Exot. iii. t. 255, f. C. D. (1782).

Euthalia Adonia, Hubner, Verz. bek. Schmett. p. 41.

Nymphalus Adonia, Godart, Enc. Méth. ix. p. 400.

Adolias Adonia, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 11.

♂ *Aconthea Lubentina*, Horsfield, Catal. Lep. Mus. E. I. C. t. 5, f. 5 (nec Cramer).

Hab. Java.

In Museum East India Company.

The female of *Adolias Adonia* may at once be distinguished from that sex of *A. Lubentina*, by having the broad white band extending across the hind-wing, this being replaced in *A. Lubentina* by a row of small crimson spots.

8. *Adolias Lubentina*, Cramer.

♀ *Papilio Lubentina*, Cramer, Pap. Exot. ii. t. 155, f. C. D. (1779); Fabricius, Ent. Syst. iii. pt. 1, p. 121 (1793); Donovan, Ins. of China, t. 36, f. E. ♂.

Euthalia Lubentina, Hübner, Verz. bek. Schmett. p. 41.

Nymphalis Lubentina, Godart, Enc. Méth. ix. p. 400.

Adolias Lubentina, Boisduval; E. Doubleday, List Lep. Brit. Mus. pt. i. p. 103; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 10.

Hab. N. India, Ceylon.

The male of *Adolias Lubentina* is correctly figured by Donovan and the female by Cramer.

The transformations of *A. Lubentina* have been discovered by A. Grote, Esq., of Calcutta, and will be figured in the Catalogue of the *Lepidoptera* in the Museum of the East India Company.

9. *Adolias Kesava*, Moore. (Pl. III. fig. 5, ♂, ♀.)

Adolias Kesava, n. sp.—Male. Upperside dark dusky brown, powdered across the disc with green. Underside yellowish-ochreous, more dusky about the margins, with black discoidal marks; two indistinct transverse blackish lines across the disc; below discoidal cell of fore-wing a small patch of black. Female. Upperside olive-brown: *fore-wing* with a transverse row of irregular spots, the first and second long, third shortest, fourth and fifth equal, but not so long as the two first, all indented on their

outer margin, with the point inward: *hind-wing* with two blackish transverse zigzag lines. Discoidal marks blackish. Underside ochreous, dusky about the margins: *fore-wing* marked as in upperside, but with some suffused white at the apex, and a small patch of black below the discoidal cell, and another near the posterior angle: *hind-wing* with the transverse zigzag lines tinged with whitish within; broadly from the base of wing along abdominal margin to anal angle greenish-grey. Discoidal mark black.

Expanse of male 2½ inches; female above 3 inches.

Hab. Silhet, N. India.

In the Collections of Entomological Society of London, British Museum, W. W. Saunders, Esq.

10. *Adolias Sedeva*, Moore. (Pl. IV. fig. 3, ♀.)

Adolias Sedeva,* n. sp.—Female. Upperside brown: *fore-wing* with transverse row of whitish spots, the first two long, each with a point outward, the rest to the posterior margin very small, along the inner margin of the band only, the rest of the band being brown, its outer margin defined by a dusky line; hind-wing with two transverse zigzag blackish lines. Discoidal mark blackish. Underside. Fore-wing reddish-ochreous, greenish at the base and along outer margin and at the apex, band as in upperside, but more defined: *hind-wing* deep glossy greenish-grey, with transverse lines as in upperside, tinged anteriorly within with white. Discoidal marks black.

Expanse 3¼ inches.

Hab. Assam.

In Entomological Society's and Hopeian Collection at Oxford.

Remark.—In one specimen of this species in the Hopeian Collection at Oxford the white colour of the band on both sides is almost obsolete, being present only on the inner and outer ends of the two first spots. This species may easily be distinguished from the same sex of *Adolias Kesava* by the transverse band having the point of each spot *outward*, whereas in *A. Kesava* these are indented *inward*.

11. *Adolias Mahadeva*, Moore. (Pl. IV. fig. 1.)

Adolias Mahadeva, n. sp.—Male. Upperside dark dusky brown, smeared with purple on exterior margin of fore-wing: *hind-wing* with a broad band to exterior margin, whitish anteriorly, bluish posteriorly, with a central longitudinal row of

* Since proved to be the female of *Adol. Apiades* (see page 77).

small dusky spots. Underside light brown, exterior margins greyish; discoidal marks and submarginal row of indistinct spots blackish.

Expanse $2\frac{3}{8}$ inches.

Hab. unknown.

In the Collection of W. W. Saunders, Esq.

12. *Adolias Ramada*, Moore. (Pl. IV. fig. 5, ♂.)

Adolias Ramada, n. sp.—Male. Upperside dark glossy olive-brown: *fore-wing* with the discoidal marks black, olive-green within; from posterior margin near angle upwards powdered with green, with a central zigzag black line: *hind-wing* with outer margin broadly from abdominal margin to near anterior angle blue, the anterior angle being pale brown, with a sub-marginal central zigzag blackish line along its whole length. Underside dusky ochreous, most dusky about the outer margins; two transverse zigzag lines and discoidal marks blackish.

Expanse $2\frac{2}{10}$ inches.

Hab. Malacca (Wallace).

In the Collection of W. W. Saunders, Esq.

Remark.—May be distinguished from the male of *A. Salia* in having the band on the outer margin of hind-wing blue, whereas in *A. Salia* the inner half is pure white.

13. *Adolias Kanda*, Moore. (Pl. IV. fig. 2.)

Adolias Kanda, n. sp.—Male. Upperside dark glossy greenish olive-brown, with discoidal markings, and two transverse zigzag lines, blackish. Underside deep ochreous, with brownish outer margins; discoidal markings black; transverse lines less defined and paler than above.

Expanse of male $2\frac{1}{4}$ inches. Female unknown.

Hab. Borneo (Wallace).

In Collection of W. C. Hewitson, Esq.

14. *Adolias Salia*, Moore. (Pl. IV. fig. 4, ♂, ♀.)

Adolias Salia, n. sp.—Male. Upperside deep dark brown: *fore-wing*, from costal margin near apex to posterior margin near angle, a narrow zigzag white line, margined outwardly with black and then with dull blue; within the anterior portion of this line the ground colour is paler; indistinct black markings at the base; narrow ciliæ spotted with white: *hind-wing*, from anterior margin

near angle a rather broad white band, slightly curving to abdominal margin near anal angle, and which is margined outwardly with a zigzag black line, the points being inward; anterior angle pale brown; from anal angle outside the band dull blue; narrow white ciliæ. Underside dull ochreous, the transverse band of the *fore-wing* broad and partly brown anteriorly, white posteriorly, and both wings margined within with dusky black, and outwardly with zigzag black line; markings at base of wing black; anterior margin dusky. Body and abdominal margin greenish-ochreous. Female dull brown: *fore-wing* with broad tapering transverse white band, intersected by the veins, and suffused more or less with brown anteriorly on the inner portion, and margined outward with a narrow lanceolate black line, the points being inward; base of wing with indistinct black marks: *hind-wing* with broad white band, intersected by the veins, slightly curving from anterior margin to abdominal margin near anal angle, being margined outwardly with broad lanceolate black marks, the point being inward, these again being narrowly margined outwardly with white; base of wing with indistinct marks; narrow ciliæ spotted with white. Underside ochreous; markings as above, but the bands less distinct; body and abdominal margin greenish grey. Shape of wings as in *A. Aconthea*.

Expanse of male $2\frac{1}{8}$, female $2\frac{6}{8}$ inches.

Hab. Java.

In Museum East India Company.

15. *Adolias Palguna*, Moore. (Pl. VI. fig. 1.)

Adolias Palguna, n. sp.—Male. Upperside dull brown, dusky about the apex: *fore-wing* with a transverse band of irregular shaped white spots, more or less suffused with brown, the outer margins of which have lanceolate black marks pointing inward; base of wing with indistinct marks: *hind-wing* with narrower curved white band from anterior margin to anal angle, margined outwardly with a broad lanceolate mark between each vein, and again by bluish-white; inner portion of disc pale, with indistinct black marks at base of wing. Underside pale greyish-white, tinged with ochreous at the base and apex, with markings as above, but very indistinct; abdominal margin greenish-grey. Female. Upperside as in male, but paler, the underside being tinged with very pale purple on the exterior half. Wings shaped as in *Adolias Trigerta*.

Expanse of male $2\frac{1}{4}$, female $2\frac{3}{4}$ inches.
Hab. Java.
In Museum East India Company.

16. *Adolias Pulasara*, Moore. (Pl. VI. fig. 2.)

Adolias Pulasara, n. sp.—Allied to *A. Palguna*, but differs in the male, on the upperside, in the *fore-wing*, in having the transverse band tinged with hyaline-blue; there is also a cyaneous tinge about the extremity of the cell: the band on the *hind-wing* is rather broader and composed of less lanceolated portions. Underside very pale ochreous, band of fore-wing tinged with pale hyaline-blue: *hind-wing* with two rows of small deep black lanceolate spots (representing the band of the upperside); base of wing with a number of deep black marks. Female. Upperside as in male, and the underside with paler markings.

Expanse of male $2\frac{5}{8}$, female 3 inches.

Hab. Malacca, Singapore, Penang.

In the Collection of British Museum, East India Company, W. W. Saunders, Esq., and W. C. Hewitson, Esq.

17. *Adolias Lutala*, Moore. (Pl. VI. fig. 3.)

Adolias Lutala, n. sp.—Upperside brown, darker about the apex and outer margins: *fore-wing* with transverse short inner row of five brownish-white spots, and an outer row of six white zigzag marks, these latter having inward pointed black marks; markings at the base of wing black: *hind-wing* with basal markings, inner row of small ill-defined lunular marks, and an outer row of small lanceolate spots, black. Underside pale pinky-buff, deeper on basal half of fore-wing: *fore-wing* with basal markings, and two transverse rows of small marks, black: *hind-wing* also with basal markings, and two transverse row of small spots, black. Female marked as in the male, but rather less defined; underside with the markings much less defined, those of the hind-wing replaced by an ill-defined transverse band.

Expanse of male $2\frac{1}{2}$ inches, female $2\frac{3}{4}$ inches.

Hab. Borneo (Wallace).

In Collection of British Museum, and W. C. Hewitson, Esq.

18. *Adolias Puseda*, Moore. (Pl. VI. fig. 5.)

Adolias Puseda, n. sp.—Female. Upperside brown, with a pale purple tinge: *fore-wing* with a broad band of irregular-shaped

purplish hyaline-like spots, each spot being concave on the outward margin; also a sub-marginal row of ill-defined whitish spots; base of wing with indistinct black marks: *hind-wing* with two curved rows of indistinct whitish spots, with some indistinct blue spots between the two rows. UNDERSIDE ochreous, whitish on the exterior margins; band of *fore-wing* bluish-white, bound outwardly narrowly with brown; distinct black marks within discoidal cell: *hind-wing* with two narrow curved indistinct ochreous-brown bands.

Expanse 3 inches.

Hab. Penang (Dr. Cantor).

In Museum East India Company.

19. *Adolias Merta*, Moore. (Pl. VI. fig. 4, ♀.)

Adolias Merta, n. sp.—Female. UPPERSIDE luteous brown, paler beyond the middle of the fore-wings, where they are slightly glossed with pale green; a row of five white spots suffused with brown on fore-wing. UNDERSIDE pale buff, with the lituræ nearly black, and slender; the pale broad sub-marginal space clearer and nearly white, with blackish row of spots.

Expanse $2\frac{7}{8}$ inches.

Hab. China.

In Hopeian Collection, Oxford.

20. *Adolias Trigerta*, Moore. (Pl. V. fig. 2.)

Adolias Trigerta, n. sp.—UPPERSIDE dark brown; male: *fore-wing* with a transverse row of six whitish spots, more or less suffused with brown, from sub-costal vein, one-third from the apex to near posterior margin, near the angle, the first two spots being long and oval, third the smallest, fourth and fifth larger than the third and both alike, sixth smaller and heart-shaped, all of them terminating outward in a point, which is bounded by black; base of wing with indistinct black markings; posterior margin at the angle with a small blue patch: *hind-wing* with a band of seven clear white spots, curving from anterior margin near the angle to abdominal margin near the anal angle, these spots having within each, on the outward portion, a black lanceolate mark pointing outward, which is slightly margined laterally with blue, and those nearest the anal angle with a short black line crossing the vein above the lanceolate mark; base of wing with indistinct black markings; abdominal margin pale brown. UNDERSIDE greyish: *fore-wing* with the costal margin and basal half ochre-

ous-yellow; the band of spots less distinct than above, but bounded inwardly with black lunulated marks, and outwardly with a black spot at the point of each; the markings at the base of the wing broadly black: *hind-wing* with a purple-red tinge on the anterior half; the band of spots less defined, bounded inwardly with black lunulated marks, and outwardly with triangular black spots, those near the anal angle with a narrow line above; base of wing with broad black marks, within, above and below the cell. Body and legs ochreous-yellow. Female: upperside as in the male, but with the markings larger; underside as in male, but the markings less distinct. Hind-wings of male rounded as in female.

Expanse of male $2\frac{1}{2}$, female $2\frac{3}{4}$ inches.

Hab. Java.

In Museum East India Company.

21. *Adolias Japis*, Godart.

Nymphalis Japis, Godart, Enc. Méth. ix. p. 382 (1819); Lucas, Hist. Nat. Lep. Exot. t. 69, f. 1.

Adolias Japis, Boisduval, E. Doubleday, List. Lep. Brit. Mus. pt. i. p. 104; Westwood in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 8.

Hab. Java.

In Museum East India Company.

Adolias Japis. The male may be distinguished by the dark velvety-brown of the upperside, the fore-wing having a marginal band from apex widening to posterior margin, then broadly crossing obliquely the disc of the hind-wing from anterior angle to lower end of abdominal margin; this band being in some specimens blue, with white along its middle, in others purplish or bluish-white. A beautiful white ciliæ extends throughout the exterior margins. The female is dull brown, with a corresponding whitish band; and a transverse row of brownish-white spots crossing the disc of fore-wing broadly from anterior to posterior margin; other markings as in male.

Expanse of male $2\frac{1}{8}$, female $2\frac{3}{4}$ inches.

22. *Adolias Gopia*, Moore. (Pl. V. fig. 4, ♀.)

Adolias Gopia, n. sp.—Female. Upperside deep pinky-brown, with a slight purple shade: *fore-wing* with transverse row of whitish irregular spots, each terminating in a point between the vein, the first two long, and tinged with brown across their middle, the rest shorter; basal markings black: *hind-wing* with taper-

ing white band from middle of anterior to middle of abdominal margin, bounded broadly exteriorly with pale blue, which is centred with a row of whitish spots. Underside dull ochreous, with whitish bands and discoidal markings of fore-wing *only*, as above.

Expanse 3⅛ inches.

Hab. unknown.

In British Museum Collection.

23. *Adolias Ambalika*, Moore. (Pl. V. fig. 3, ♀.)

Adolias Ambalika, n. sp.—Female. Upperside dark brown: *fore-wing* with transverse band of white spots, each spot with a long black point outward, between the veins; also an outer row of less defined lanceolated whitish marks; black markings at base of the wing: *hind-wing* with transverse band of smaller spots as in fore-wing, also with an outer row of lanceolate marks. Underside pale ochreous, marked as above, with the black marks to the white band broader.

Variety.—Upperside much darker brown: *fore-wing* with the transverse band suffused with brown; space between the band to near exterior margin bluish: *hind-wing* with less defined band of smaller lanceolate marks, between which to near exterior margin bluish, centred with whitish lanceolate marks. Underside dull ochreous, with brown margins; band of lanceolate marks as above, but less suffused with brown.

Expanse 3 inches.

Hab. Borneo.

In Collection at British Museum, East India Company, W. W. Saunders, Esq.

24. *Adolias Jahnu*, Moore. (Pl. VII. fig. 1, ♀.)

Adolias Jahnu, n. sp.—Female. Upperside obscure brown, glossed with green: *fore-wing* with indistinct black zigzag lines across the disc, tinged with white anteriorly; markings at base of wing large and indistinct: *hind-wing* with two indistinct black zigzag lines across the disc, also indistinct black basal marks. Underside ochreous-brown, with transverse zigzag lines and basal marks as above; apex of fore-wing with a white spot and a blackish patch; exterior margin dusky; base of hind-wing, and along the outer zigzag line, with a bluish-grey tinge. Anterior wings falcate.

Expanse 3¼ inches.

Hab. Darjeeling, N. India.
In Museum East India Company.

25. *Adolias Sikandi*, Moore. (Pl. VII. fig. 4, ♀.)

Adolias Sikandi, n. sp.—Female. Upperside obscure glossy pale greenish-brown: *fore-wing* with the disc from middle of anterior to middle of posterior margin white, sharply defined inwardly from the basal half by an irregular zigzag division; also parallel pale brown and white spots; two large black marks within discoidal cell: *hind-wing* with narrow curved white band, tapering from middle of anterior to near middle of abdominal margin, and sharply defined inwardly from the basal half; a submarginal row of deep brown lunular spots; blackish marks within discoidal cell. Underside ashy-grey, tinged with blue, basal half dark, exterior half very pale; markings as above; on hind-wing a small red spot in centre of anterior basal mark.

Shape of wings as in *A. Evelina*.
Expanse 3½ inches.
Hab. Java.
In Museum East India Company.

26. *Adolias Evelina*, Stoll.

♂ *Papilio Evelina*, Stoll, in Cramer's Pap. Exot. Suppl. t. 28, f. 2, 2, B. (1791).
Nymphalis Evelina, Godart, Enc. Méth. ix. p. 401.
Adolias Evelina, Boisduval; E. Doubleday, List Lep. Brit. Mus. pt. i. p. 104; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 7.
Adolias Derma, Kollar, in Hügel's Kaschmir, iv. pt. ii. p. 436 (1844); Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 292, n.

Hab. N. India, Assam, Ceylon.
In Museum East India Company.
In *Adolias Evelina* the sexes are alike, the male being well figured by Stoll.

27. *Adolias Cocytina*, Horsfield.

♂ *Aconthea Cocytina*, Horsfield, Zool. Journ. v. p. 67, t. 4, f. 3, 3 a (1830).
Adolias Cocytina, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 3.

♂ *Papilio Cocyta*, Fabricius,* Ent. Syst. iii. pt. i. p. 127 (1793); Jones, Icon. iv. t. 64, f. 2.

Nymphalis Cocyta, Godart, Enc. Méth. ix. p. 382.

Adolias Cocyta, E. Doubleday, List Lep. Brit. Mus. pt. i. p. 104.

Adolias Godartii, G. R. Gray, Catal. Lep. Ins. Nepal, p. 14, t. 2, f. 2 (1833).

Hab. Sumatra, Borneo.

In Museum East India Company.

Remark.—Of *Adolias Cocytina* I am acquainted only with the male. The female is as yet undetermined.

28. *Adolias Cocytus*, Fabricius.

Papilio Cocytus, Fabricius, Mant. Inst. ii. p. 29 (1787); Ent. Syst. iii. pt. 1, p. 55.

Adolias Cocytus, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 9.

Nymphalis Cocytus, Godart, Enc. Méth. ix. p. 368.

Adolias Sidera, Boisduval, MS.

Hab. N. and S. India.

Remark.—*Adolias Cocytus* of either sex may at once be distinguished by the ashy marginal band widening from apex of the fore-wing to abdominal margin.

29. *Adolias Adima*, Moore.

Adolias Adima, n. sp.—Male. Upperside yellowish olive-brown, with two indistinct zigzag lines crossing the disc of both wings, and markings about the base of the wings blackish. Underside pale ferruginous, palest at the base of fore-wings, with inner row of lunulated marks and outer row of spots crossing the disc of both wings, and markings at the base of the wings black, the spots being deepest from the anal angle, where they are margined with bluish-white; abdominal margin broadly, and about anal angle somewhat green.

Expanse 2½ inches.

Hab. Assam.

In Museum East India Company.

The male of *A. Adima* may at once be distinguished from *A. Apiades* by its plain brown upperside.

30. *Adolias Sananda*, Moore. (Pl. VII. fig. 3.)

Adolias Sananda, n. sp.—Male. Allied to *A. Adima*, but differs in having the upperside purplish olive-brown, and the transverse

* But not *Pap. Cocytus*, Fabricius.

zigzag lines of both wings are wider apart and well defined. The underside differs in having the markings much less defined, and the hind-wing is devoid of the greenish colour of the abdominal margin, and the spots are without the bluish borders.

Expanse 2½ inches.

Hab. Assam.

In Collection British Museum and J. O. Westwood, Esq.

31. *Adolius Telchinea*, Menetries.

Adolius Telchinea, Menetries, Catal. Lep. Mus. Imp. Acad. of Sci. St. Petersburg, pt. ii. t. ix. f. 3.

Hab. N. India.

In Mus. Imp. Academy at St. Petersburg.

Adolius Telchinea.—Upperside dark brown, with a blue border to the outer margin of hind-wing. Underside brown, with two indistinct darker transverse lines, and blackish discoidal markings.

Expanse 2½ inches.

32. *Adolias Apiades*, Menetries.*

♂ *Adolias Apiades*, Menetries, Cat. Lep. Mus. Imp. Acad. of Sci. St. Petersburg, pt. ii. pl. ix. f. 4.

Hab. Darjeeling.

In Collection British Museum and East India Company.

Adolias Apiades.—Male. Upperside dark glossy olive-brown, with two lunulated lines crossing the disc of both wings, and markings at base of wing black, the lines obscure at the upper ends on the fore-wing; a greenish-blue marginal band from anal angle broadly along exterior margin. Underside dusky ferruginous, greenish at the apex of fore-wing, and thickly so on the posterior half of hind-wing, and the abdominal margin tinged with yellow; transverse lines as in upperside, but broader and very black from the anal angle; also the basal marks.

Expanse of male 2½ to 3 inches.

33. *Adolias Vasanta*, Moore. (Pl. VII. fig. 2.)

Adolias Vasanta, n. sp.—Female. Upperside vinaceous brown, palest along exterior margins: *fore-wing* with oblique transverse row of six small white spots; discoidal marks indistinct, black: *hind-wing* with indistinct discoidal marks, and sub-marginal row of small black spots. Underside buff-grey, tinged with brown

* *Adol. Sedeva* is since proved to be the female of this species.

across the disc; exterior margin purplish-white; markings as above.

Expanse $2\frac{3}{8}$ to $2\frac{7}{8}$ inches.

Hab. Ceylon.

In the Collection of British Museum, and W. W. Saunders, Esq.

34. *Adolias Sancara*, Moore. (Pl. IX. fig. 1.)

Adolias Sancara, n. sp.—Male. Upperside brown: *fore-wing* with an outward oblique white band from middle of costal margin to near posterior margin above the angle; also two small white spots near the apex; an indistinct blackish transverse band from near apex of fore-wing to abdominal margin, also an indistinct narrow sub-marginal blackish band on the hind-wing; black marks within discoidal cell. Underside greyish-brown, greyer at the base and along exterior margins; marked as upperside. Female darker, and marked as in the male.

Expanse of male $3\frac{1}{4}$, female $3\frac{1}{2}$ inches.

Hab. Darjeeling, N. India.

In Museum East India Company, and Hopean Coll. at Oxford.

35. *Adolias Nara*, Moore. (Pl. VIII. fig. 1.)

Adolias Nara, n. sp.—Female. Upperside dark glossy golden olive-green, with blackish marginal and sub-marginal lines: *fore-wing* with oblique transverse row of six white spots, from middle of costal margin to near posterior angle, also two small sub-apical white spots; marks within discoidal cell black: *hind-wing* with two white spots on costal margin near the angle. Underside glossy verdigris-green, apically olive-green: *fore-wing* with markings as above, but more defined and whiter; lower part of disc patched with blue-black: *hind-wing* with transverse row of six white spots from costal margin to near the posterior angle; indistinct discoidal markings. Ciliæ white.

Expanse $3\frac{5}{12}$ inches.

Hab. unknown.

In Museum Entomological Society of London.

36. *Adolias Iva*, Moore. (Pl. VIII. fig. 2.)

Adolias Iva, n. sp.—Male. Upperside very dark olive-green: *fore-wing* with oblique row of large, long, greenish-white spots from middle of costal margin to near posterior angle, beneath which is a small narrow geminated spot near the middle of the posterior margin; also two small spots obliquely near the apex, and a small suffused whitish patch at the posterior angle: *hind-wing*

with a row of broadly separated small round greenish-white spots, curving from middle of costal margin to middle of the wing; also black marks within discoidal cell. Underside deep greenish-grey, dusky about the anterior half, and blackish along the posterior margin; markings as above, but the spots on the hind-wing extending nearly to abdominal margin. Shape of wings as in *A. Epiona*.

Expanse 4 inches.

Hab. Darjeeling.

In Museum East India Company.

37. *Adolias Epiona*, G. R. Gray.

Aconthea Epiona, G. R. Gray, Lep. Nepal, p. 13 (1833).

Adolias Doubledayii, Boisduval, MS.; E. Doubleday, List Lep. Brit. Mus. pt. i. p. 104 (1844); G. R. Gray, List. Lep. Nepal, p. 13; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 15.

Adolias Patala, Kollar in Hügel's Kaschmir, iv. pt. ii. p. 435. (1844).

Hab. N. India.

In most Collections.

Adolias Epiona.—Upperside pale olive-green; with two obscure darker narrow lines crossing the disc of both wings: *fore-wing* with oblique row of yellowish-white spots from middle of costal margin to beyond middle of the wing, opposite posterior angle; also two smaller spots on costal margin near the apex: *hind-wing* with two yellowish-white spots on costal margin nearer the angle. Blackish marks at the base of both wings. Underside pale yellowish-green: *fore-wing* with oblique row of spots as above, but less defined, and having two additional very small spots on the lower part of the disc; on the hind-wing the spots extend by the addition of small ones to the middle of the wing. Sexes alike.

Expanse of male 3¾, female 4 inches.

38. *Adolias Confucius*, Westwood.

♀ *Adolias Confucius*, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 16 (1850).

Hab. China.

In the Collection of J. O. Westwood, Esq.

Adolias Confucius is closely allied to, but differs from, *A. Epiona* in being larger, and having on the upperside the oblique band and

sub-apical spots also larger; on the hind-wing the lower spot is lunulated and reversely curved.

Expanse $4\frac{1}{4}$ inches.

39. *Adolias Sahadeva*, Moore. (Pl. VIII. fig. 3.)

Adolias Sahadeva, n. sp.—Male. Upperside olive green, with darker submargin and inner portion of disc: *fore-wing* with oblique row of five pale greenish-yellow spots from middle of costal margin; two small whitish sub-apical spots; space between discoidal marks and along outer margin yellowish: *hind-wing* with transverse tapering row of six pale greenish-yellow spots from costal margin to near abdominal angle, bounded below with pale yellow; two transverse disco-cellular black lines; abdominal margin greenish-grey. Underside greenish-yellow, lighter and darker in portions; marked as above, discoidal markings on both wings, lower part of disc of fore-wing with blackish patches.

Expanse $3\frac{1}{4}$ inches. In Collection British Museum and W. C. Hewitson, Esq.

40. *Adolias Kardama*, Moore. (Pl. IX. fig. 3.)

Adolias Kardama, n. sp.—Male. Upperside olive-green, brownish along exterior margins: *fore-wing* with row of eight small yellowish-white spots curving from middle of anterior to middle of posterior margin; also two sub-apical spots; a sub-marginal row of indistinct blackish spots, the space between this and the curved row patched with yellowish-white, marks at the base of wing black: *hind-wing* with transverse row of six yellowish-white spots, diminishing in size to a small dot, the three anterior spots confluent, with a broad hemispherical outer border; an indistinct sub-marginal blackish line. Underside suffused with grey, marked as above. Female. Upperside as in male, but the spots larger, the discal space paler. Underside as in male.

Expanse of male $3\frac{1}{2}$, female 4 inches.

Hab. China. In the Collection of J. O. Westwood, Esq.

41. *Adolias Durga*, Moore. (Pl. IX. fig. 2.)

Adolias Durga, n. sp. Upperside dark iridescent olive-green, with a black marginal and sub-marginal band; a broad transverse band of irregular-shaped white spots crossing from middle of costal margin of fore-wing to beyond the middle of the hind-wing, near the anal angle, being margined exteriorly with blue from the fore-wing on its lower half to anal angle; the narrow space

between marginal and sub-marginal bands also bluish; two small rounded white spots near the apex of fore-wing; marks within discoidal cells black. Underside, from inner margin of band to base, greenish-grey, from its outer margin to extremity of wing greenish, with band and apical spots as above; a row of blackish marks from apical spots to posterior angle, which is whitish; also an indistinct dusky sub-marginal row on the hind-wing, and at the anal angle two patches of black; marks at the base of wings black. Ciliæ between the indentations on the upper and underside white. Sexes alike.

Expanse 4 inches.

Hab. Darjeeling.

In Museum East India Company, Entomological Society of London.

42. *Adolias Teuta*, E. Doubleday.

♂ *Adolias Teuta*, E. Doubleday, MS.; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 5, t. 44, f. 2 (1850).

Hab. N. India, Silhet, Java.

In Museum East India Company.

Adolias Teuta.—Male. Upperside blackish-brown, palest on exterior margins, with a transverse band of pale greenish-yellow spots crossing the middle of both wings, the spots being smallest and interrupted on the fore-wing; also a single small spot near the apex, and a minute dot of the same colour within the discoidal-cell of the fore-wing; a row of indistinct triangular black spots near exterior margins; and two or three indistinct pale spots from anterior angle of hind-wing. Underside pale brown, suffused in patches with dusky brown; band and apical spot as above, pale green; a row of small black short longitudinal spots from apex of fore-wing to anal angle; a rounded spot and a lunular black mark, centred with crimson within discoidal-cell of fore-wing, and in that of the hind-wing a small dot and two short black lines; base of costal margin of both wings tinged with crimson.

Female. Upperside paler, and the row of triangular black spots more distinct; the marks within the discoidal-cell of fore-wing also distinct but black. Underside as in male.

Expanse of male $2\frac{3}{4}$, female $3\frac{1}{4}$ inches.

43. *Adolias Franciæ*, G. R. Gray.

Adolias Franciæ, G. R. Gray, Lep. Ins. of Nepal, p. 12, t. 14 (1833); E. Doubleday, List Lep. Brit. Mus. pt. ii. p.

104; Westwood in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 14.

Hab. Darjeeling.

In Museum East India Company.

Adolias Franciæ.—Male. Upperside dark olive-green, brown along the exterior margins; with a transverse yellowish band crossing the middle of both wings; also two yellowish spots near the apex, and on both wings a sub-marginal row of yellowish-white spots, those near and at the anal angle being greenish, with an inner row of indistinct black spots. Underside bluish-grey, marked as above, but with a patch of black near the posterior angle of fore-wing.

Expanse of male from $2\frac{7}{8}$ to $3\frac{1}{4}$ inches.

Female unknown.

44. *Adolias Coresia*, Hübner.

♀ *Hypolimnas Coresia*, Hübner, Samml. Exot. Schmett. Band ii. tab. (1806-27).

Adolias Coresia, E. Doubleday, List Lep. Brit. Mus. pt. i. p. 105.

♂ *Aconthea Apaturina*, Horsfield, Zool. Journ. v. p. 68, t. 4, f. 1, 1a (1830).

Adolias Apaturina, Westwood in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 4.

Hab. Java.

In Museum East India Company.

Adolias Coresia.—Male. Upperside deep brown-black: *fore-wing* with marginal and sub-marginal row of minute white spots, also a minute spot one-third from the apex near costal margin: *hind-wing* with broad blue band from abdominal angle tapering to anterior angle, with a sub-marginal row of black spots bounded exteriorly with white. Underside dark brown, with marginal row of lunulate marks, short sub-marginal dots and oblique row of spots and two bars within discoidal cell purple-white: *hind-wing* with marginal row of black spots, encircled with purple-white; also a sub-marginal row of small dots, and a single spot near base of wing purple-white.

Female dark brown, marked as in male, but the band on *hind-wing* purple-white.

Expanse of male 2 to $2\frac{3}{8}$, female $2\frac{5}{8}$ inches.

The figures above quoted are good representations of the sexes of *Adolias Coresia*.

45. *Adolias Nicea*, G. R. Gray.

Aconthea Nicea, G. R. Gray, Lep. Ins. of Nepal, p. 13, t. 12, f. 1 (1833).

Adolias Nicea, Doubleday, List. Lep. Brit. Mus. pt. i. p. 105; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 2.

Hab. Darjeeling.

In Museum East India Company.

Adolias Nicea.—Male. Upperside velvety-black; *fore-wing* with a marginal, short sub-marginal, and a shorter third row of small white spots, the marginal row bounded inwardly by a row of small indistinct blue spots; also indistinct blue marks within discoidal cell: *hind-wing* with a marginal row of black spots encircled with blue inwardly, and with white outwardly. Ciliæ white. Underside brown-black: *fore-wing* as above: *hind-wing* with marginal row of white lunulated spots, and a sub-marginal row of minute white dots.

Female. Upperside marked as in male, but washed with olive-green, the marginal row of encircled spots of hind-wing larger, and with a sub-marginal narrow greenish line. Underside with the three rows of white spots on *fore-wing* extending to posterior margin; on the *hind-wing* the marginal row of lunulated spots are larger, and there is a sub-marginal row of white spots, also a third inner row of bluish-white spots.

Expanse of male $2\frac{1}{4}$ to $2\frac{3}{4}$, female $2\frac{3}{4}$ inches.

46. *Adolias Nesimachus*, Boisduval.

Adolias Nesimachus, Boisduval, in Cuvier's Règ. An. édit. Crochard, Ins. t. 139, f. 1 (183–); E. Doubleday, List Lep. Brit. Mus. pt. i. p. 105; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 12.

Argynnis Hippomenes, Kaden, in Herr. Schæffer's Lep. Exot. ser. ii. fasc. 1 et 2, fig. 11, 12 (1853).

Hab. N. India, Assam, Darjeeling.

In Collection British Museum, East India Company, &c.

Adolias Nesimachus.—Upperside black, suffused more or less with green: *fore-wing* with a number of whitish spots disposed about the basal half; at the extremity of discoidal cell three longitudinal streaks, and above these on costal margin some narrow streaks, white; a double sub marginal row of narrow white zigzag lines, and a marginal row of white spots; *hind-wing* with whitish

spots about the middle; a curved row of black spots above a sub-marginal row of narrow zigzag white marks, the latter more or less geminated about the middle; and a marginal row of narrow lunulated white lines. UNDERSIDE black, with markings as above on *fore-wing*, and tinged with blue; the spots on the *hind-wing* bluish, but more or less obsolete, the surface of the wing being tinged with green; the row of deep black spots as above. Sexes alike.

Expanse of male 3, female $3\frac{3}{8}$ inches.

47. *Adolias Dunya*, E. Doubleday.

Adolias Dunya, E. Doubleday, MS.; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 6, t. 44, f. 2 (1850).

Hab. Borneo (Wallace).

In the Collection British Museum, W. W. Saunders, Esq., and W. C. Hewitson, Esq.

Adolias Dunya.—Male. UPPERSIDE olive-brown, with a row of small yellow spots crossing the middle of both wings, each spot being encircled with black; discoidal marks on fore-wing black, inner mark bounded on each side by a yellow dot; an indistinct sub-marginal row of blackish spots. UNDERSIDE pale whitish-green; row of spots indistinct; discoidal marks and sub-marginal row of spots blackish.

Expanse 4 inches.

48. *Adolias Dirtea*, Fabricius.

♀ *Papilio Dirtea*, Fabricius, Ent. Syst. iii. pt. 1, p. 59 (1793); Jones, Icon. iv. t. 65, f. 1.

Adolias Dirtea, E. Doubleday, List Lep. Brit. Mus. pt. i. p. 104; G. R. Gray, List Lep. Nepal. p. 12, t. 10, f. 1♀, 2♂; Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 17, t. 44, f. 1♀.

Aconthea Boisduvalii, G. R. Gray, MS.; Boisduval, Spec. Gén. Lép. i. t. 8, f. 2.

Hab. N. India, Assam, Penang (Cantor), Sumatra (Raffles), Borneo.

In most Collections.

Adolias Dirtea.—Male. UPPERSIDE velvety-black; *fore-wing* with a few more or less distinct cyaneous spots about the base and along the costal margin, and a small white spot near the apex; from apex widening to posterior angle cyaneous: *hind-wing* with broad purple and green sub-marginal band, lined within along its outer margin with a row of black spots, below each of

which proceeds, between the veins, a narrow purple or green streak to the exterior margin. Underside deep olive-green, and spotted with white about the middle of the wings; posterior half of fore-wing blue-black. Female. Upperside brown-black, covered with bluish-white spots, disposed in linear series; the *fore-wing* with a marginal and the *hind-wing* with marginal and sub-marginal row of bluish or purple-white lunular marks, those on the hind-wing joined and forming circles. Underside dark olive-green, somewhat greyish on the hind-wings, marked as in upperside, but the spots larger. In some specimens the upperside of the male has the marginal band of the fore-wing dark olive-green, with the small spots and whole underside deep ochreous; and in some females the upperside is brown, with all the spots pale ochreous.

Expanse of male $3\frac{1}{4}$ to $4\frac{1}{4}$, female $3\frac{1}{2}$ to nearly 5 inches.

49. *Adolias Siva*, Westwood.

♀ *Aconthea Doubledayi*, Westwood, Cab. Oriental Ent. p. 76, t. 37, f. 4 (1847).

Adolias Siva, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 18 (1850).

Hab. Silhet.

In Collection British Museum, East India Company, W. W. Saunders, Esq.

Adolias Siva.—Male. Upperside: *fore-wing* ochreous-yellow, with spots on the basal half, and irregular lines across the disc and along exterior margin, and the apical portion of the wing, broadly black: *hind-wing* from the base to disc ochreous-yellow, barred with black; within, and spot below discoidal-cell, white; rest of the wing black, with two rows of whitish spots; abdominal margin whitish; body spotted with pale ochreous. Underside nearly as in upperside; markings and colours paler.

Expanse 3 inches.

50. *Adolias Hesperus*, Fabricius.

Papilio Hesperus, Fabricius, Ent. Syst. iii. pt. 1, p. 47 (1793); Jones, Icon. iv. t. 73, f. 1.

Nymphalis Hesperus, Godart, Enc. Méth. ix. p. 387.

Adolias Hesperus, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 22.

Hab. unknown.

Adolias Hesperus.—"Alis repandis, fuscis, nigro-undatis: anticis punctis quatuor albis." *Fabr.*

51. *Adolias Pelea*, Fabricius.

Papilio Pelea, Fabricius, Ent. Syst. iii. pt. 1, p. 133 (1793).
Nymphalis Pelea, Godart, Enc. Méth. ix. p. 383.
Adolias Pelea, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 291, n. 21.
Adolias Pelea.—" Alis dentatis, fuscis, anticis maculis sagittatis albis nigrisque ; subtus omnibus cinereis, lunulis nigris."—*Fab.*
Hab. East Indies (Fabricius).

According to Fabricius and Godart, " this species is of medial size ; the *fore-wings* have the UPPERSIDE obscure brown, with some black lunules near the base, with a large band composed of white and black arrow-shaped spots towards the extremity. The *hind-wings* also obscure brown, with black lunules, besides a white streak following the band of the fore-wing. The UNDERSIDE of fore-wing is ashy-grey, with a number of brown lunules, especially on the hind-wing. The band of the fore-wing is less apparent."

52. *Adolias Monima*, Fabricius.

Papilio Monima, Fabricius, Ent. Syst. iii. pt. 1, p. 127 (1793).
Nymphalis Monima, Godart, Enc. Méth. ix. p. 383.
Adolias Monima, Westwood, in Doubleday and Hewitson's Diurnal Lep. p. 292, n. 24.
Hab. East Indies (Fabr.)
Adolias Monima.—" Alis dentatis, fuscis ; posticis brunneis angulo ani cærulescente striga nigra."—*Fab.*

" UPPERSIDE. *Fore-wings* blackish, with ferruginous spots, less distinct at the base, and a small bluish streak at the interior angle : *hind-wings* blackish at the base, the extremity brown, and having towards the anal angle a large bluish mark, on which there is a blackish undulated line. UNDERSIDE ash colour, with black lunules at the base, and a transverse line of the same colour towards the extremity."

Remark.—The three last species I have been unable to identify from the descriptions published.

EXPLANATION OF THE PLATES.

PLATE III.

Fig. 1. *Adolias Parta*, ♂ ♀.
2. ,, *Garuda*, ♂ ♀.
3. ,, *Phemius*, ♂ ♀.
4. ,, *Alpheda*, ♂ ♀.
5. ,, *Kesava*, ♂ ♀.

PLATE IV.

Fig. 1. *Adolias Mahadeva*, ♂.
2. ,, *Kanda*.
3. ,, *Sedeva*, ♀.
4. ,, *Salia*, ♂ ♀.
5. ,, *Ramada*, ♂.

PLATE V.

Fig. 1. *Adolias Anosia*, ♂ ♀.
2. ,, *Trigerta*.
3. ,, *Ambalika*.
4. ,, *Gopia*.

PLATE VI.

Fig. 1. *Adolias Palguna*.
2. ,, *Pulasara*.
3. ,, *Lutalu*.
4. ,, *Merta*.
5. ,, *Puseda*.

PLATE VII.

Fig. 1. *Adolias Jahnu*.
2. ,, *Vasanta*.
3. ,, *Sananda*.
4. ,, *Sikandi*.

PLATE VIII.

Fig. 1. *Adolias Nara*.
2. ,, *Iva*.
3. ,, *Sahadeva*.

PLATE IX.

Fig. 1. *Adolias Sancara*.
2. ,, *Durga*.
3. ,, *Kardama*.

IV. *Notes upon the Species of* Elateridæ *in the Stephensian Cabinet.* By G. R. Waterhouse, Esq., F.Z.S. &c.

[Read Dec. 7th, 1858.]

In the following list I have given, in the first column, the species of *Elateridæ*, as they occur in Stephens' Manual; and, in the second column, I have added, opposite each species, the name now commonly adopted for the same on the Continent, or a name which I think will most probably hereafter be adopted.

Stephens' Cabinet, &c.	Genus.	Species.
Adrastus limbatus.	*Adrastus* (Eschsch.)	*limbatus*, Fab.
——— *acuminatus*, Steph.	*Agriotes* (Eschsch.)	*acuminatus*, Steph.
	———	*sobrinus*, Kiesenw.?

This insect much resembles the *Dolopius marginatus*, but the joints of its antennæ are shorter; the thorax is not acutely margined at the sides, excepting on the hinder part; and the elytra are rather shorter and more acuminated behind.

Dolopius marginatus.	*Dolopius* (Eschsch.)	*marginatus*, Linn.
Agriotes sputator.	*Agriotes* (Eschsch.)	*sputator*, Linn.
——— *obscurus.*	———	*obscurus*, Linn.
——— *lineatus.*	———	*lineatus*, Linn.
——— *pilosus*, Steph.	———	*ustulatus*, Schaller.
Sericosomus fugax.	*Sericosomus* (Redt.)	*brunneus*, Linn.
——— *brunnipennis.*	———	*brunneus*, Linn.
——— *brunneus.*	———	*brunneus*, Linn.

Messrs. Foxcroft and Turner, both of whom have taken

these so-called species plentifully, inform us that they have found the extreme varieties (i. e. *brunneus* and *fugax* of the older authors) *in copulâ*. They have long been suspected to be one species; and, in the most recent work upon the German *Elateridæ* (that of Kiesenwetter) they are put together. The *Sericosomus brunnipennis* of Stephens, moreover, forms an intermediate variety between *S. fugax* and *S. brunneus*.

Stephens' Cabinet, &c.	Genus.	Species.
Sericosomus fulvicollis, Steph.	*Ischnodes* (Germ.)	*sanguinicollis*, Panz.
Ectinus aterrimus.	*Melanotus* (Eschs.)	*niger*, Fab.
Limonius cylindricus.	*Limonius* (Eschs.)	*cylindricus*, Payk.
——— *serraticornis.*	———	*minutus*, Linn.

Stephens' description appears to belong to the true *L. serraticornis*, but of that insect I have never seen a British example.

——— *minutus.**	———	*minutus*, Linn.
——— *Bructeri*, Steph., Man.		

Not in Stephens' collection; I have seen no British specimen of the *Elater Bructeri*, Fab., which now forms the type of Kiesenwetter's genus *Pheletes*.

——— *nigrinus*, Payk.

Not in Stephens' collection; the *Elater nigrinus* of Paykul (*Elater nigrinus*, Kiesenw.—*Ampedus nigrinus*, Germ.), however, is known to be a British insect.

Elater ephippium.	*Elater* (Linn., Kiesenw.)	*sanguinolentus*, Schrank.
	Ampedus, (Germ.)	*ephippium*, Oliv.
——— *sanguineus.*	———	*lythropterus*, Germ.
——— *rufipennis.*	———	*sanguineus*, Linn.

* In Leach's collection there are two specimens of an allied species of *Limonius*, of a shorter form than the *L. minutus*, and with the thorax more finely and thickly punctured. I believe it to be the *S. lythrodes* of Germar.

Stephens' Cabinet, &c.	Genus.	Species.
Elater semiruber.	*Elater*	*lythropterus*, Germ.
——— *crocatus.*	———	*pomorum*, Herbst.

In the collection, but not named. I am not acquainted with the *E. crocatus* as British.

——— *pomonæ.* | ——— sp. ?

The *Elater pomonæ* of Stephens' collection I have long thought was an immaculate variety of *E. ephippium*, but upon comparing Stephens' insect, and others like it which I have received from the New Forest (found by Turner), with specimens of *Ephippium*, I find the former have the head and thorax covered with long black hairs, whilst the same parts in my specimens of *Ephippium* are clothed with short, and for the most part palish, hairs. I have immaculate specimens taken by myself in company with *Ephippium*, and which agree in every respect with the others, excepting in the want of the dark patch. Turner's insect I do not think was taken in company with *Ephippium*, in the normal condition at least. There is amongst Stephens' specimens, placed to represent his *E. pomonæ*, one specimen evidently of a distinct species, and which I regard as the *E. præusta* (Fab.) Germ.

——— *præustus.*	———	*elongatulus*, Oliv.
——— *balteatus.*	———	*balteatus*, Linn.
——— *bipustulatus.*	*Corymbites* (subgenus *Diacanthus*, Kiesenw.)	*bipustulatus*, Linn.
Elater ustulatus.	*Corymbites*(*Diacanthus*).	*bipustulatus*, var.
Prosternon holosericeus.	*Corymbites* (subgenus *Tactocomus*, Kiesenw.)	*holosericeus*, Fab.
Agrypnus murinus.	*Lacon* (Germar)	*murinus*, Linn.
——— *varius.*	*Adelocera* (Latr.)	*varia*, Fab.

Not in collection.

Stephens' Cabinet, &c.	Genus.	Species.
Hypolithus riparius.	*Cryptohypnus* (Germ.) / *Cryphthypnus* (Kiesenw.)	*riparius*, Fab.
——— *rivularis.*	———	*riparius*, Fab.
Cryptohypnus agricola.	———	*quadripustulatus*, Fab.
——— 4-*pustulatus.*	———	*tetragraphus*, Germ.
——— *dermestoides.*	———	*dermestoides*, Herbst.

I feel little doubt that the two last-mentioned insects are varieties of the same species.

——— *pulchellus.*

Formerly represented, in Stephens' collection, by specimens of *Crypt.* 4-*pustulatus;* the specimens remain, but the name has been removed. The *Crypt. pulchellus* I suspect is not British.

Drasterius bimaculatus.	*Drasterius* (Eschsch.)	*bimaculatus*, Fab.

In Leach's collection, not in Stephens'.

Melanotus fulvipes.	*Melanotus* (Eschsch.)	*rufipes*, Herbst.
Ludius ferrugineus.	*Ludius* (Latr.)	*ferrugineus*, Linn.
Ctenicerus aulicus.	*Corymbites* (Latr.)	*aulicus*, Panz.

In Leach's, but not in Stephens' cabinet.

——— *pectinicornis.*	———	*pectinicornis*, Linn.
——— *cupreus.*	———	*cupreus*, Fab.

Includes the variety, with immaculate elytra, *Corymbites æruginosus*, Germar.

——— *castaneus.*	———	*castaneus*, Linn.
——— *sanguinicollis.*	*Ischnodes* (Germ.)	*sanguinicollis*, Panz.
——— *tessellatus.*	*Corymbites* (subgen. *Actenicerus*, Kiesenw.)	*tessellatus*, Linn.

Stephens' Cabinet, &c.	Genus.	Species.
Ctenicerus metallicus.	*Corymbites* (sub-gen. *Diacanthus* (Kiesenw) genus *Diacanthus*, Germ.)	*metallicus*, Payk.
Selatosomus æneus.	*Corymbites* (*Diacanthus*)	*æneus*, Linn.
——— *cruciatus* (not in coll.)	——— (———)	*cruciatus*, Linn.
Cardiophorus thoracicus.	*Cardiophorus* (Eschsch.)	*thoracicus*, Fab.
——— *ruficollis.*	———	*ruficollis*, Linn.
——— *equiseti.*	———	*asellus*, Erichs.

Note.—The true *Elater equiseti* of Herbst (Archiv. 114, 36) belongs, according to Erichson and Kiesenwetter, to the section of the genus *Cardiophorus*, in which the claws are dentate; Stephens' insect has them simple, and appears to agree better, on the whole, with Erichson's description of *C. asellus;* there is, however, in Stephens' collection a specimen of a *Cardiophorus*, in which the claws are dentate (it stands, with specimens of *C. asellus*, under the name of "*Cordiger*" in the collection); this specimen I am inclined to refer to the *C. cinereus* of Erichson (*Elater cinercus*, Herbst). Of the same species there are two or three specimens in Leach's collection.

Aplotarsus testaceus.	*Corymbites* (*Liotrichus*, Kiesenw.)	*quercus*, Gyll. var.
——— *ochropterus.*	———	do. do.
——— *rufipes.*	——— ———	*quercus*, Gyll.
——— *quercus* (not in coll.)		
——— *tibialis.*	——— ———	*quercus*, Gyll.
Ctenonychus hirtus.	*Synaptus* (Eschsch.)	*filiformis*, Fab.
Athous rhombeus.	*Athous* (Eschsch.)	*rhombeus*, Oliv.
——— *niger.*	———	*niger*, L. / *hirtus*, Herbst.
——— *hæmorrhoidalis.*	———	*hæmorrhoidalis*, Fab.

Stephens' Cabinet, &c.	Genus.	Species.
Athous elongatus.	*Agriotes* (Eschsch.)	*pilosus* ? Panz.

The insect in Stephens' cabinet is a rubbed and mutilated specimen, apparently of the *Agriotes pilosus* (*Elater pilosus*. Panz.). It is the only British example (and a very doubtful one) of this insect I have seen.

Athous subfuscus.

Certainly not the *Elater subfuscus* of Gyllenhal, as Mr. Stephens supposed, but a mere variety, as it appears to me, of the *Athous vittatus.*

——— *vittatus.*	*Athous* (Eschsch.)	*vittatus*, Fab.
——— *angularis.*		

The same as Stephens' *A. subfuscus.*

——— *longicollis.*	———	*longicollis*, Oliv.
Campylus linearis.	*Campylus* (Fischer).	*linearis*, Linn.

V. *On the Genus* Erycina, *Linn., with Descriptions of some New Species.* By W. Wilson Saunders, Esq., F.R.S., &c.

[Read Jan. 7th, 1858.]

In the year 1849 I laid before the "Entomological Society" descriptions of several new species of the genus *Erycina*, Linn., together with an enumeration of the species which had been previously described. Since that period the exertions of collectors in tropical America have brought to light other species which are new to science, and further information regarding the known species has reached this country, so that it appears desirable again to take the genus *Erycina* in hand, and place the new matter before the Society, in a paper which will form a continuation of the one already published on the same subject in the Society's Transactions. Mr. Westwood, since that paper was written, has revised the whole family of *Erycinidæ* in the "Genera of Diurnal Lepidoptera," where he makes but little alteration in the view I held of the tailed species forming but a single genus—the true *Erycinas*. The only change he proposes is the separation of the clear-winged species, considering them generically distinct, and placing them under the name *Zeonia*. In the propriety of this I think he is justified, as further study of the species shows that they have characters which well and distinctly separate them from the nearest allied forms of the restricted genus *Erycina*. Mr. Westwood, in the work alluded to, described one new species of *Erycina* under the name of *Belphegor*, and this is the only addition to the tailed species which has taken place since my first paper was written. Of species nearly allied to the true *Erycinas*, Mr. Westwood, in the same work, described certain tail-less forms, placing them in two new genera, *Necyria* and *Lyropterix*. In the following sketch I shall include the new species falling under these genera, as they are associated with the true *Erycinas* by some Entomologists, and should be treated of at the same time.

The species, which I yet retain under the generic term *Erycina*, seem to fall into the following seven sections :—

1. *Rhetus*, Swain.
2. *Diorina*, Morisse.
3. *Melibœa*, W. W. Saunders,
4. *Rodina*, Westwood.
5. *Nirodia*, Westwood.
6. *Euerycina*, W. W. Saunders.
7. *Riodina*, Westwood.

Of these sections, the 1st and 2nd, *Rhetus* and *Diorina*, have been distinguished by the authors whose names stand against them, and are known by the great length of the tail. They pass one into the other without any well-marked division. Section 3, which I name *Melibœa*, is distinguished by short rounded tails in the males, which have blue metallic reflections on the underside of the wings. The females where known are dissimilar in colouring and form to the males, and further information respecting them will probably show that the species of this section will form a good generic group. Section 4, *Rodina*, Westwood, consists of female insects, some of which I have no doubt will prove to be the males of the section *Melibœa*. Section 5, *Nirodia*, Westwood, is composed of a single female, but it is so different in form and markings to the individuals of section 4, that it is necessary to place it at present in a distinct section. Section 6, *Euerycina*, is a form of which both sexes are known; and the posterior wing, attenuated into a long tail, distinguishes it readily from the other sections. This seems to claim generic distinction, but in our present imperfect acquaintance of the true *Erycinas* I prefer to leave it where it is. The same may be said of the last section, 7, *Riodina*, Westwood, consisting only of the well-known and distinct form *Lysippus*, of which the female sex has only yet been detected.

In my former paper I enumerated twenty-five species of *Erycina*, since which, if the species falling under the genera *Necyria* and *Lyropteryx* be included—four fresh ones have been added—three by Mr. Westwood and one by Mr. Hewitson, making a total of twenty-nine. With the additions which will be found hereafter, the species will amount to forty-four. Of these both the sexes are known of ten; the males only of sixteen; the females only of twelve, and six species have the sex undetermined. Looking to the amount of unpaired males and females, there can be little doubt, that, hereafter, this number will be considerably re-

duced by a more extended study of the species by those who have an opportunity of seeing them alive in their native haunts.

The following table will give a concise view of the species at present known; their arrangement into genera and sections; the information obtained regarding the sexes, and the countries the species inhabit.

ZEONIA, Swainson.

Octavius, Fab. ..... Guinea.
Amazon, W. W. Saund. ♂ and ♀ .. Amazon region.
Bogota, W. W. Saund. ♂ ..... New Grenada.
Batesii, W. W. Saund. ♂ and ♀ .. Amazon region.
Timandra, W. W. Saund. ♂ ..... Brazil, New Granada.
Xantippe, G. R. Gray. ♂ ..... Brazil.
Heliconoides, Swain. ♂ and ♀ ..... Brazil.

ERYCINA, Lin.

1st Section. *Rhetus*, Swain.

Butes, Clerk. ♂ and ♀ ..... Brazil, Venezuela.
Rhetus, Cram. ♂ ..... Surinam.
Huana, W. W. Saund. ♀ ..... Amazon region.
Thia, Moresse. ♂ ..... Mexico, Honduras.
Aristoderus, Bois. ..... Cayenne.

2nd Section. *Diorina*, Morisse.

Laonome. ♂ and ♀ ..... Brazil, Venezuela.
Dysonii, W. W. Saund. ♂ and ♀ .. Venezuela.
Psecas, Doub. ..... Bolivia.
Iphinoe, Hub. ♂ and ♀ .....

3rd Section. *Melibœa*, W. W. Saunders.

Atahualpa, W. W. Saund. ♂ ..... New Grenada.
Montezeuma, W. W. Saund. ♂ .... Mexico.
Huascar, W. W. Saund. ♂ ..... New Grenada.
Julia, Doub. ♂ and ♀ ..... Amazon region.
Etias, W. W. Saund. ♂ ..... Peru.
Pyretus, Cram. ♂ ..... Amazon region.
Colubra, W. W. Saund. ♂ ..... Amazon region (Ega).
Inca, W. W. Saund. ♂ ..... Mexico.

4th Section. *Rodinia,* West.

Glaphyra, Doub. ♀ ..... Brazil (Para).
Pandana, Doub. ♀ ..... Brazil (Bahia).
Tedea, Cram. ♀ ..... Surinam.
Aulestes, Cram. ♀ ..... Surinam.
Jurgensenii, W. W. Saund. ♀ ..... Mexico.
Eryxo, W. W. Saund. ♀ ..... Peru.
Periander, Cram. ♀ ..... Surinam.
Ocollo, W. W. Saund. ♀ ..... New Grenada.

5th Section. *Nirodia,* West.

Belphegor, West. ♀ ..... Amazon region.

6th Section. *Euerycina,* W. W. Saunders.

Calphurnia, W. W. Saund. ♂ and ♀. Amazon region.

7th Section. *Riodina,* West.

Lysippus ♀ ..... Brazil (Para), &c.

Necyria, West.

Bellona, West. ..... West Brazil.
Hewitsonii, W. W. Saund. ♀ ..... New Grenada.
Saundersii, Hewit. ♂ ..... New Grenada.
Manco, W. W. Saund. ♂ ..... New Grenada.
Duellona, West. ..... New Grenada.
Tapaja, W. W. Saund. ♂ ..... Amazon region.

Lyropterix, West.

Apollonia, West. ♂ and ♀ ..... Amazon region.
Terpsichore, West. ..... Brazil.
Lyra, W. W. Saund. ♂ ..... New Grenada.

The figures accompanying this paper are contributed by my excellent friend Mr. W. C. Hewitson, whose talent in delineating Lepidopterous insects needs no comment on my part. I am greatly obliged to him for them.

Zæonia Amazon, W. W. Saund. (Pl. X. figs. 3 and 4.)

Anterior wings rather pointed, transparent, with a small black patch at the base; the anterior margin, the lateral margin, the nervures and a transverse somewhat notched band arising on the

anterior margin, about one-third the length of the wing from the base, and terminating just within the posterior angle, of the same colour. Posterior wings somewhat elongated, transparent, with the internal and external margins margined with black, and a black band in continuation of the transverse band of the anterior wings crossing the wing and running nearly parallel with the exterior margin, terminated with diverging, slender, strap-shaped tails about half the length of the wing, black, with the tips margined with white, and having at their base a large somewhat triangular crimson patch crossing the wing nearly from side to side. Underside of wings of the same colour and markings as the upper, except that there appears one or two small white specks on the crimson patch at the base of the tails. Head, antennæ, body and legs black. The females resemble the males, except that they are rather larger, with the anterior wings less pointed; the abdomen more globose and massive, and the anterior legs made for walking.

Expansion of wings, males $1\frac{1}{2}$, females $1\frac{3}{4}$ inch.

In my own Collection, and that of the British Museum and Mr. Hewitson.

The species was sent from the Upper Amazon region in some numbers by Mr. Bates. It is very closely allied to *P. Octavius*, Fab., but differs in its larger size, the shorter diverging tails and in the abdomen not being tipped with yellow at the apex.

Zeonia Bogota, W. W. Saunders.

The anterior wings are transparent; above, with the base, nervures, anterior margin, exterior margin, and a transverse band crossing the wing from near the centre of the anterior margin to just within the anal angle, black. Posterior wings are rather full, rounded on the exterior margin, contracted towards the apex, and thence spreading backwards in a straight direction for a distance equal to one-third their length, and terminated by a long narrow rather diverging tail, transparent, above with the nervures, interior and exterior margins, the produced portion of the tail, and a longitudinal narrow band arising from under the band of the anterior wings, and directed towards the apex of the abdomen, black, excepting a crimson somewhat oval elongated transverse spot, with a white speck at the external margin, which crosses the end of the produced part of the wing; wings below nearly as above, the crimson spot only being margined posteriorly by a white interrupted line. Head, antennæ, legs and abdomen black.

Expansion of wings $1\frac{7}{10}$ inch.

From Bogota, in the Collection of the British Museum.

This species most nearly resembles *Z. Amazon*, but is immediately distinguished from it by the shape and smaller size of the crimson spot on the hinder wings. From *Z. Batesii* it is distinguished by its larger size and the shape of the hinder wings, which have a transverse black band.

Zeonia Batesii, W. W. Saund. (Pl. X. figs. 1 and 2.)

Anterior wings much pointed, transparent, with the base, anterior margin, outer margin, nervures and a nearly central transverse band, black. Posterior wings narrow, about twice the length of the body, terminated by a long narrow tail-like appendage in continuation of the outer margin, and nearly as long as the wing; and also by a sharp-pointed tooth-like projection in continuation of the inner margin, transparent, with a black band along the inner and outer margins, uniting before the apex, and forming there a large black patch, which is crossed in the centre by a crimson slightly curved band nearly as long as the wing is broad, and having below an obsolete band of minute white spots. The nervures, tail and tooth-like projection of the hinder wings are black. The underside of the wings are marked as the upper. The head, antennæ, body and legs are black.

Expansion of wings $1\frac{3}{10}$ inch.

Collected in the Upper Amazon region by Mr. Bates.

In the Collections of the British Museum, W. W. Saunders, &c.

The female is very similar to the male in size, colour and markings, chiefly differing in the anterior wings being more rounded on the exterior margin, making them appear less pointed, and in the tails being greatly diverging and somewhat curved inwards. In Mr. Hewitson's Collection.

This is a small species, with well-marked characters, having in the hinder wings no longitudinal band, as in all the other species of this section.

Zeonia Heliconoides, Swain. ♀. (Pl. X. fig. 5.)

Under an impression that the figure given in the "Zoological Illustrations" of Mr. Swainson, pl. 3, 2nd Series, was that of the male of this species, the female was figured in the accompanying Pl. X. fig. 5. Examining the details given by Mr. Swainson there can be no doubt that his figure represents a female. A second figure of the female of so rare an insect will not be, how-

ever, out of the way in this place, particularly as there are some differences, such as the larger and broader crimson spot at the base of the tails, and the greater width of the black band on the outer margin of the anterior wings. The specimen figured is in my own Collection, and was, I believe, obtained from Brazil.

Erycina Huana, W. W. Saunders.

The anterior wings are pointed, with the exterior margin curved outwards, black, crossed by two white semi-transparent bands, one straight and rather broad near the base, and the other slightly curved outwards, commencing on the anterior margin midway between the apex and the basal band, and terminating on the hinder margin near the anal angle; the band is unequal in width, being narrowed both anteriorly and posteriorly. Hinder wings much elongated, contracted in the middle, with the interior margin straight, terminated by a narrow-pointed diverging tail-like appendage, half the length of the wing, and in continuation of the outer margin; black, with a semi-transparent band in continuation of the basal band of the upper wing, running down the disc of the wing nearly centrally, rather broad, gradually growing to a point, and terminating about half the length of the wing; also with a thread-like streak of bluish-white along the upper portion of the outer margin; two crimson spots crossing the wing a little below the greatest contraction, one largish, triangular, on the inner margin, the other minute, round on the disc, and a line of small greyish-blue spots, a little behind the crimson spots, nearly crossing the wing and inclining towards the tail, which are margined with white interiorly at the base, and crossed with many lines of minute greyish freckles. The head and antennæ are black. Thorax bluish-black above, below dark brown, with the legs and abdomen of the same colour. The underside of the wings are marked as the upper, except that there is a small crimson spot on the anterior margin of the first pair at the base.

Expansion of wings $1\frac{3}{10}$ inch.

From the Amazon region, collected by Mr. Bates.

In my own Collection.

This is a ♂ insect, and nearly related to the ♂ of Butes, but quite different in the shape of the posterior wings, as well as in the character and position of the markings and its smaller size. It resembles also the *Rhetus* of Cramer, differing again in the shape of the hind wings and the bands of the fore wings. It

might turn out to be the ♂ of *Rhetus*, should Cramer's insect be a ♀, which I think it is.

Erycina Atahualpa, W. W. Saunders. (Pl. XI. fig. 14.)

The anterior wings are pointed; above black, with a narrow straight crimson band crossing from the anterior to the posterior margin in a slanting direction, so as to touch the latter about the centre; below black, with two irregular broad bright shining steel-blue bands crossing the wing in the same direction as the crimson band above. The posterior wings are elongated, and produced into a short broad somewhat diverging tail, with two slight blunt teeth on the inner margin, and three projections of the same kind on the outer margin; above black, with a crimson band arising immediately under the termination of the band of the upper wing, and running thence in a slanting direction towards the anal angle, where it terminates with a slight curve inwards, leaving the margin free; also with a crimson spot on the inner margin near the apex of the abdomen, and a row of six brilliant blue rounded spots running between the crimson band and the outer margin, and crossing the base of the broad tail, which itself is blue in certain lights, and has two white specks on its inner margin, and three white specks of the same character occur in the indentures of the teeth on the outer margin of the wing; beneath black, with two bright shining steel-blue bands of the same description as those of the anterior wings, one at the base and the other on the exterior margin, corresponding with the row of blue spots on the upper surface; also with an elongated crimson spot agreeing in position with the crimson spot on the upper surface. Head, antennæ, body and legs black.

Expansion of wings $1\frac{8}{10}$ inch.

Inhabits New Grenada.

In the Collection of Mr. Hewitson.

This species approaches very closely to *Ery. Montezeuma*, W. W. Saunders, from Mexico. It differs in the deep black of the ground colour of the upperside of the wing, the absence of a second band on the anterior wings, and of the large crimson spot at the base of the tail. The bright blue spots on the upper surface of the posterior wings are also larger, rounder and more decided. The specimen described, the only one I have seen, is a ♂.

Erycina Huascar, W. W. Saunders. (Pl. XI. fig. 15.)

Black; anterior wings rather pointed above, with a broadish,

nearly straight band crossing the wing from a point near the anterior margin, about one-third its length from the base of the wing, and terminating on the posterior margin, about the same relative distance from the posterior angle. This band only reaches the costal nervure, showing beyond a mere speck of the crimson colour; below with brilliant steel-blue reflections, crossed with black nervures, and leaving a black band at the base, and another of the same colour, nearly corresponding in position with the crimson band, on the upper side. Posterior wings subtrigonate, terminated with a short, somewhat sharply pointed, diverging tail, with a straight uniform crimson band of about half the width of the band of the anterior wings, and arising immediately below it, and thence running nearly parallel to the outer margin to a short distance beyond the apex of the abdomen, where it terminates on the disc of the wing. A little above this point, on the inner margin of the wing, is a small crimson spot. At the base of the tail, running across the narrow portion of the wing, is a row of three minute blue spots. The tail has two broadish teeth on the inner margin, with white specks in the indentures, and there are three white specks on the outer margin of the wing. The underside of the posterior wings have the same brilliant blue reflections as on the anterior wings, with a black band crossing them, nearly corresponding with the crimson band on the upperside, and also a little within the inner margin a large round crimson spot, just behind the termination of the abdomen, and a small white spot on the same margin at the base of the tail.

Expansion of wings 2 inches.

Inhabits New Grenada.

In the Collection of Mr. Hewitson.

This is the largest species of the section, and with very distinctly marked characters. The specimen in Mr. Hewitson's Collection is a male.

Erycina Elias, W. W. Saunders. (Pl. XI. fig. 11.)

Anterior wings rather pointed, and rounded on the exterior margin; above purplish black, with a narrow nearly straight crimson band crossing the wing from a point nearly central on the anterior margin to a point also nearly central on the posterior margin, and also with an ill-defined bluish line-like curved band between the crimson band and the exterior margin, running nearly midway between them; below velvety black, with two bright steel blue shining bands, which change to vivid green in

certain lights, and which are traversed with black nervures. These bands cross the wing, running into the anterior margin, which is lined with the same brilliant colour, leaving a triangular patch at the base, a central oblong transverse space, and a gradually diminishing band, broadest at the apex, along the external margin, of the ground colour. Posterior wings rather narrow and terminated with a short blunt somewhat diverging tail; above purplish black, the tail and external margin purplish blue in certain lights, with a narrow crimson band in continuation of the crimson band of the anterior wing, running across the middle of the wing nearly parallel with the outer margin, and suddenly bending upwards and gradually vanishing a little below the apex of the abdomen before it reaches the anterior margin. Behind this band, and midway between it and the tip of the tail, is a long, narrow, rather wavy, crescent-shaped patch of crimson colour, nearly crossing the base of the tail, curving upwards before it reaches the outer margin, where it runs into an obsolete bluish band which passes alongside the margin and nearly midway between it and the crimson band; on the outer margin are four specks of white in the indentations, and two more in like situations at the tip of the tail; below velvety black, with the base and anterior margin of the same shining blue as that on the underside of the anterior wings, and a broad band of the same blue colour on the outer margin, leaving a broad central band, a line along the outer margin, and the interior margin of the tip of the tail, of the ground colour. The blue base of the wing and band of the same colour on the outer margin are crossed with black nervures. Head, antennæ, body and legs black, except the anterior pair, which are steel-blue.

Expansion of wings $1\frac{8}{10}$ inch.

In my own Collection. Received from Peru.

The specimen described is a ♂, which strongly resembles *Pyretas*, Cram., but differs in the shorter and blunter tails, in having the crimson bands of the upper surface of the wings narrower, and in the disposition of the metallic blue bands and markings of the underside of the wings.

Erycina Colubra, W. W. Saund. (Pl. XI. fig. 12.)

The anterior wings are sharply pointed, with the outer margin somewhat indented; above black, with a rather broad crimson straight band, crossing the wing from a point on the outer margin a little within the centre and terminating near the centre of the posterior margin, the band being somewhat broader at its termi-

nation; also with a very obsolete scarcely apparent reddish-brown band running midway between the crimson band and the exterior margin, which is marked with spots in the spaces between the termination of the nervures; below brilliant shining blue, except the apex and the nervures, which are black. Posterior wings elongate, with three teeth on the exterior margin, tapering and terminating with a broad obtuse scarcely diverging tail, which has three blunt teeth at the apex; above black, with a narrow straight crimson band in continuation of the broader band of the anterior wings, and terminating on the disc a little beyond the apex of the abdomen, and a large crimson nearly semicircular patch crossing the base of the tail, the curved side of the patch being directed towards the tail, and also a very narrow reddish-brown band between the crimson band and the outer margin. On the indentations of the outer margin of the wing there are three white specks, and there are two white specks in like situations at the tip of the tail; below coloured as above, except the space in front of the crimson spot is brilliant blue, with the nervures marked with black, and there is also a faint bluish tinge on the apex of the tail. Head, antennæ, body and legs velvety black, except the anterior pair of legs, which are blue.

Expansion of the wings $1\frac{5}{10}$ inch.

Discovered at Ega, on the River Amazon, by Mr. Bates.

In the Collection of the British Museum.

I have only seen males of this elegant but small species. The nearly straight broad tails, with large crimson spot at the base, distinguish the species from all its congeners at once.

Erycina Eryxo, W. W. Saunders. (Pl. XI. fig. 13.)

Anterior wings rather short and obtuse at the apex; above black-brown, with a broad straight white band arising on the anterior margin about one-third of its length from the base, and proceeding to the middle of the posterior margin, gradually increasing in width until it is nearly double what it was at its commencement. About midway between this and the exterior margin there is an ill-defined narrow whitish band curved outwards running across the wing; below as above, except that the narrow band is broader, whiter and better defined. Posterior wings rather short, terminating in a broad rather long-pointed diverging tail; above blackish brown, with a broad white band in continuation of the broad band of the anterior wing running nearly parallel with the interior margin and curving suddenly nearly at right angles

until the margin is reached. This curved portion of the band is narrower and bright vermilion in colour. Nearly midway between the white band and the exterior margin is a very faint line-like whitish-brown wavy band, about the length of the broader band, and in the indentations of the exterior margin are three white specks. There is also a wavy vermilion band crossing the base of the tail from the outer margin, in a direction nearly parallel to the internal margin of the tail, until it reaches the internal margin of the wing, just before which it runs up and joins the vermilion portion of the broader band by an angular projection. The tail is tipped with a small white patch, and there are three white specks in the indentations of its inner margin; below very nearly as above. Head, body, antennæ and legs black.

Expansion of wings $1\frac{7}{10}$ inch.

From Peru.

In my own Collection.

This female, somewhat resembling *E. Jurgensenii* from Mexico in colour, but very different in its markings and much smaller in size. It is, I expect, a female of one of the species in the section *Melibœa*.

Erycina Ocollo, W. W. Saunders. (Pl. X. figs. 6 and 7.)

The head, antennæ and body are black. The palpi short, scarcely projecting beyond the front of the head. The anterior wings are large and full; the exterior margin curved outwards; above black, with a broad bright orange band passing in a slanting direction, from about the centre of the anterior margin to the exterior margin near the anal angle, and with an ill-defined narrow yellowish-brown band running about midway between the apex of the wing and the orange band, and nearly parallel with the latter; below the colouring is as above, except that the apical band is white, crossed with black nervures. The posterior wings are full and rather short, terminated by a sharp-pointed rather long very diverging tail. They are black, with a central yellow band broken in the middle, wide at its commencement near the centre of the anterior margin, and terminating at the apex of the abdomen. Behind the yellow band is an angular row of spots between it and the apex of the wing; those near the outer margin yellow and parallel with the margin; the remainder white, running parallel with the apex of the wing. A broad bright patch of blue, crossed with black nervures, occupies the surface of the wing between

the white spots and the broken portion of the yellow band. The inner margin of the tail has three elongated white spots upon it. The under surface of the posterior wings differs from the upper in having the yellow band continuous, the band of spots all white and larger in size, and being devoid of the blue patch of colour. A ♀ variety occurs where the posterior wings want on both surfaces the apical band; and the posterior wings have the yellow band reduced to a triangular patch on the anterior margin on both surfaces, and the band of spots is not so decided on the upper side, but the blue patch is spread over more of the disc of the wing. See Pl. X. fig. 6.

Expansion of wings $1\frac{9}{10}$ inch.

Inhabits New Grenada.

In the Collection of Mr. Hewitson.

A very distinct and beautiful species, apparently given to variations, and quite unlike any yet discovered.

Erycina Calphurnia, W. W. Saunders. ♂. (Pl. X. fig. 8.)

In my former paper on the *Erycinidæ*, in the "Transactions of the Entomological Society," I described the female of this species, that sex being only then known. Since the publication of that paper, Mr. Bates has sent from the Amazon region the male, which differs from the female in the following respects. In having the transverse white bands of the wings narrower, the one on the posterior wings not arising so immediately under the termination of the band of the anterior wing, and terminating on the disc of the wing before the wing is half traversed; in having a red streak of colour extending along the internal margin of the posterior wing from the base to the tail; in having the tails somewhat longer and glossed above with a delicate pale greyish-blue colour, and on the underside in having a little more of the red colour at the base of the tails.

Expansion of wings $1\frac{3}{4}$ inch.

The nature of the long tail-like appendages to the posterior wings, alike in both sexes and general style of colouring, makes me place this species in a section by itself, to which I give the name of *Euerycina*, and probably, when the transformation of the species are known, this section will form a good sub-genus.

Necyria Hewitsonii, W. W. Saunders. (Pl. X. figs. 9 and 10.)

The head and antennæ are black. The anterior wings are above black, with a transverse rather broad crimson curved band

crossed with black nervures, commencing near the middle of the anterior margin, where it is the broadest, and passing thence towards the outer margin, and terminating almost in a point near the anal angle, after running for a short distance parallel with the outer margin ; below nearly as above, but the transverse band is broader and paler in colour, and the black colour has a steel-blue iridescence. Posterior wings above black, with a rather broad band of bright blue colour crossed with black nervures running parallel with the outer margin and at a short distance from it, and six spots of a whitish colour in the fringe. Below steel-blue, with the nervures strongly marked with black, and some pale crimson streaks forming a patch of colour on the inner margin just below the apex of the abdomen ; body and legs black.

Expansion of wings 2 inches.

Received from New Grenada.

In the Collection of Mr. Hewitson.

This is a well-marked and beautiful species, apparently given to variations, as Mr. Hewitson possesses a specimen with the crimson band in the anterior wings somewhat broader than in the type, and the posterior wings above having two small crimson spots on the blue band near the anterior margin, and below an irregular pale crimson band crossed with black nervures running parallel with the hinder margin. Females only of this species are known.

Necyria Manco, W. W. Saunders. (Pl. XI. fig. 16.)

The head and antennæ are black. The anterior wings are rather pointed, above black, and crossed near the centre with a narrow somewhat curved uniform crimson band. Between the band and the outer margin, and running parallel with the former, is a row of seven rather large indistinct bluish spots, nearly touching each other and forming an irregular band ; below black, with brilliant blue markings, somewhat larger than those above, and a crimson spot on the middle of the hinder margin. Posterior wings black, with a crimson curved band in continuation of the one on the anterior wings, and crossing the wing about the centre to the interior margin, and a row of bright blue shining somewhat rectangular spots between the band and the outer margin, forming an irregular band parallel both with the band and margin, in which are six white specks of colour ; below black, with brilliant blue markings, similar somewhat to those above, and a crimson band uniform in position to the one above, but broader towards the

inner margin, and terminating in a point before the anterior margin is reached. Body and legs black.

Expansion of wings $2\frac{1}{5}$ inches.

Received from New Grenada.

In Mr. Hewitson's Collection.

Males of this beautiful and distinct species have not as yet been sent to this country.

Necyria Tapaja, W. W. Saunders. (Pl. XI. figs. 17 and 18.)

The anterior wings are above deep brownish-black, with a rather broad, transverse, straight, somewhat irregular crimson band, commencing near the anterior margin about one-third the length of the margin from the base of the wing, and proceeding to a point on the posterior margin a little within the posterior angle. Between the band and the outer margin of the wing is a line of minute white specks about six in number, commencing near the posterior angle and running in a curved direction towards the anterior margin, somewhat parallel to the outer margin of the wing. The wings below are as above, except that the crimson band is wanting all but a small patch on the posterior margin; the line of white specks larger, and the ground colour of the wings not so dark. Posterior wings above deep brownish-black, with an irregular, largish, crescent-shaped crimson spot on the disc of each wing a little below the centre, the direction of the spot lengthways being parallel to the inner margin of the wings. Underside brownish black, with an ill-defined row of six to eight minute white specks running in a curve a short distance from the hinder margin. Head, antennæ, body and legs black. There is an interesting male variety in Mr. Hewitson's collection (see fig. 18), having no crimson patch on the disc of the posterior wings, and having a larger crimson patch on the underside of the anterior wings. It is also rather larger in size.

Expansion of wings 2 inches.

Sent from the the river Tapajos, Amazon region, by Mr. Bates.

In my own and other Collections.

This is a very distinct species, differing from all others yet described, except *Bellona*, in the entire want of blue markings on the upper surface of the posterior wings, and from that species in the position and size of the crimson markings on the wings; also in the greater size of the posterior wings, which are more rounded posteriorly than in its congeners.

Lyropteryx Apollonia, Westwood. ♀. (Pl. XI. fig. 19.)

The anterior wings are full and much rounded on the outer margin; above black, except two or three minute crimson spots near the base, and a broad band of brownish-white line-like markings taking the direction of the nerves of the wing on the outer margin; below, black towards the base, near which are four crimson rounded spots; the remainder of the wing traversed by brownish-white lines in the direction of the nervures; fringe black. Posterior wings above black at the base, near which are two or three minute crimson spots, and on the exterior margin a broad crimson band, into which the black colour of the base runs in many pointed radiating lines in the direction of the nervures; below black, with ten unequal sized crimson rounded spots on the basal half, the other portion being pale crimson, traversed in the direction of the nervures with black lines, proceeding from the black colour of the base of the wing; fringe white. Head, antennæ, body and legs black, except the abdomen, which is short and stout and spotted with crimson on the sides near the apex.

Expansion of the wings 2¼ inches.

From the Amazon region.

In the Collection of the British Museum.

The foregoing description is that of a female, which, looking to the crimson spotting of the base of the wings and the band of line-like markings of the anterior wings, I believe to be the ♀ of *L. Apollonia*, Westwood, the male of which is in the National Collection, and was well figured in the "Genera of Diurnal Lepidoptera," pl. 72, fig. 1.

Lyropteryx Lyra, W. W. Saunders.

The anterior wings are sharply pointed; above velvety black, with a broad band on the outer margin of about seventeen bluish-white line-like markings running in the direction of the nervures, the band being at the apex of the wing one-third the length of the anterior margin, and gradually narrowing as it approaches the posterior angle, and having its inner margin somewhat curved outwards; fringe black; below brownish-black, with five small crimson spots placed near each other towards the base, and the remainder of the wing covered with white radiating lines, taking the direction of the nervures and gradually increasing in width as they approach the outer margin. Posterior wings with the anal angle elongated into a well-defined projection; above velvety

black, with a band of about one-fourth the length of the wing in width, on the outer margin, of radiating blue lines; fringe white; below brownish-black, with nine irregularly-sized rounded crimson spots near the base, two of which, the largest in size, are on the fold of the wing, the remainder of the wing being covered with white lines radiating in the direction of the nervures and increasing in width as they approach the posterior margin. Head, antennæ, thorax, legs and abdomen black, except two lines along the sides of the latter near the apex, which are crimson.

Expansion of wings 2 inches.

From Bogota.

In the Collection at the British Museum.

This species is a near approach to *L. Apollonia*, Westwood, but differs in its smaller size, more pointed anterior wings, the much smaller width of the marginal band of blue line-like markings on the upper surface of the same, and in other respects. The description is made from a male, the only sex known.

VI. *Descriptions of Twenty-Five Species of Indian* Micro-Lepidoptera. By H. T. Stainton, Esq., F.L.S., &c.

[Read 6th Dec. 1858]

It is now nearly three years ago since I read before this Society "Descriptions of Three Species of Indian Micro-Lepidoptera," which had been reared from the larvæ at Calcutta, by Mr. Atkinson. The species of which I then communicated descriptions were all belonging to the families of the smaller *Tineina*, one being an aberrant *Coriscium*,* and the others referable to the genera *Phyllocnistis* and *Lithocolletis* respectively.

I have since then received two consignments of insects from Mr. Atkinson, who still remains at Calcutta pursuing his Entomological investigations there. The last box of insects I received contained such a number of beautiful and interesting species, that I determined to lose no time in communicating to the Society descriptions of them. I have at present not had time to investigate the whole, but having examined twenty-five of the species, I now give my observations thereon, and hope at an early subsequent meeting to give descriptions of twenty-five more species.

One great impediment to the rapid investigation of these Indian Micros is their *bizarre* and unexpected forms; very few of the specimens are prepared to fall into any of our European genera; but in some cases there is an analogy or affinity with existing genera so strong, that not wishing a wholesale creation of genera, which is always apt to be perplexing to the future student, I have preferred to refer them doubtfully to existing genera, pointing out at the same time their discordant characters.

In two instances only have I created new genera; thus for the beautiful scarlet *Clerodendronella*, with its peculiarly formed anterior wings, singular antennæ, remarkable hind legs and extraordinary posture in repose, I have proposed the generic name of *Atkinsonia;* and for two very pretty insects, somewhat allied to *Cosmopteryx*, but with much shorter drooping palpi, the face hollow and retreating, and a fillet in front of the head between

* For descriptions of *Coriscium orientale*, *Phyllocnistis Citrella* and *Lithocolletis Bauhiniæ*, see Trans. Ent. Soc. vol. iii., N.S., pp. 301—303.

the antennæ, I have constructed a new genus, *Lozostoma;* both these new genera belong to the family *Elachistidæ*.

One can scarcely help feeling lost in utter amazement at the extraordinary variety of form and structure which the tropical forms of the *Micro-Lepidoptera* occasionally assume, and it is impossible to foresee at the present day to what extent a rigorous and systematic study of these insects from all parts of the world would modify our existing arrangements; we are too apt to work exclusively from a European basis, and single representatives here of extensive exotic families are apt to be forced in unpleasant alliance with other groups to which they are in nowise related. Just as the solitary European example of the *Erycinidæ* amongst the Diurnal *Lepidoptera*, found itself formerly grouped with the *Nymphalidæ;* and doubtless had we but a single representative of the *Noctuidæ* here, we might for years have perplexed ourselves whether it was a *Bombyx* or *Geometra*, never conceiving that it might represent a group distinct from either, and of equal importance.

It may well be asked whether we are wise in insisting on the insertion of the aberrant *Lepidoptera*, such as the *Cochliopodidæ*, the *Chlöephoridæ*, &c. in some of the main larger groups—did these small families contain hundreds of species, should we not have formed them into groups by themselves? and why should we, because their numbers are few, adopt a different view of their relations and arrangement?

But with these brief preliminary remarks I proceed with my task, namely, the descriptions of the twenty-five species.

1. *Tinea longicornis*, n. sp.
2. *Cerostoma rugosella*, n. sp.
3. *Cerostoma albofasciella*, n. sp.
4. *Anarsia candida*, n. sp.
5. *Depressaria Ricini*, Atkinson, in litt.
6. *Depressaria Zizyphi*, Atkinson, in litt.
7. *Depressaria? Ricinella*, Atkinson, in litt.
8. *Gelechia? Hibisci*, Atkinson, in litt.
9. *Gelechia? pubescentella*, n. sp.
10. *Gelechia simpliciella*, n. sp.
11. *Gelechia marginipunctella*, n. sp.
12. *Parasia? apicipunctella*, n. sp.
13. *Œcophora subganomella*, n. sp.
14. *Butalis triocellata*, n. sp.
15. *Gracilaria? auricilla*, n. sp.
16. *Gracilaria? falcatella*, n. sp.

17. *Gracilaria? ustulatella*, n. sp.
18. *Ornix? albifrons*, n. sp.
19. *Cosmopteryx Asiatica*, n. sp.
20. *Cosmopteryx? semicoccinea*, n. sp.
21. *Cosmopteryx? æneella*, n. sp.
22. *Lozostoma flavofasciata*, n. sp.
23. *Lozostoma semisulphurea*, n. sp.
24. *Atkinsonia Clerodendronella*, Atkinson, in litt.
25. *Laverna? Mimosæ*, Atkinson, in litt.

1. *Tinea longicornis*, n. sp.

Alis anticis lucidis ochreo-griseis, fascia basim versus, maculis duabus suboppositis in medio, margineque postico fuscis.

Exp. al. $3\frac{1}{2}$—$4\frac{1}{2}$ lin.

A true *Tinea* allied to *Nigripunctella*, and resembling it in the length of the antennæ, which are far longer than the anterior wings; the colour of this species is, however, more analogous to that of dark specimens of *Pellionella*, but the markings are very differently placed.

Head and face brownish. Palpi brownish-grey. Antennæ long, slender, brownish-grey.

Anterior wings shining greyish-ochreous, with an indistinct broad brown fascia near the base; on the middle of the inner margin is a distinct brown spot, and beyond it is a larger one on the costa; the two together almost form an angulated fascia, but do not touch; hind margin clouded with brown cilia, greyish-ochreous. Posterior wings pale grey, with greyish-ochreous cilia.

I have before me two specimens, collected by Mr. Atkinson, near Calcutta.

2. *Cerostoma rugosella*, n. sp.

Alis anticis fuscis, saturatiore marmorosis, dorsum versus saturatioribus, squamis numerosis exasperatis, irregulariter dispositis.

Exp. al. $8\frac{1}{2}$ lin.

A singular looking insect, exhibiting some characters of *Ochsenheimeria* in conjunction with those of *Cerostoma;* the palpi have long bristly scales, and the anterior wings are covered with erect scales, placed irregularily.

It perhaps comes nearest to *Cerostoma Horridella.*

Head and face greyish-brown. Palpi dark grey, the second joint with a projecting tuft, but composed of thick coarse scales;

terminal joint recurved, slender, brown at the base, the tip greyish-ochreous.

Anterior wings brownish, marbled with darker, and with an ill-defined dark cloud along the inner margin; scattered all over the surface of the wing are numerous erect scales, one tuft near the base being especially conspicuous; cilia brownish. Posterior wings greyish-brown, with paler cilia.

A single specimen is before me, taken near Calcutta by Mr. Atkinson. It is not in first-rate condition, but it has such a striking appearance, that I thought it better to describe it.

3. *Cerostoma albofasciella*, n. sp.

Alis anticis brunneis, fascia lata media dorsum versus repandata alba, macula costæ subapicalis, alteraque marginis postici albis.

Exp. al. 5 lin.

A strikingly distinct species, different from anything else we know.

Head and face whitish-brown; palpi rather whiter, the tuft of the second joint thick but not long, tinged with brownish externally, terminal joint white. Antennæ thick, pale brownish.

Anterior wings brown, marbled with darker, with a conspicuous broad white fascia in the middle, broadest on the inner margin, its inner edge being rather angulated, and its outer edge oblique; on the costa towards the apex is a small white spot, and a more elongate one lies on the hind margin: in one specimen I have before me these white markings are slightly suffused with very pale fuscous, and a small brownish spot lies on the inner margin towards the outer edge of the fascia; cilia pale brown, intersected by two whitish dashes below the apex. Posterior wings pale grey, with paler cilia.

I have before me two specimens, collected by Mr. Atkinson near Calcutta.

4. *Anarsia candida*, n. sp.

Alis anticis niveis, nebulis brunnescentibus, maculis duabus disci plumbeis, una ante, altera pone medium.

Exp. al. 6 lin.

A most lovely insect, totally unlike any known *Anarsia* or *Gelechia*, but has some slight resemblance to some *Tortrices* of the genus *Eupœcilia*.

Head and face snowy white. Palpi white; terminal joint black

at the base, and with a black ring before the tip. Antennæ white, with a black spot on the front of the basal joint.

Anterior wings white; a black dot on the sub-costal nervure near the base, and the costa dotted with brown-black; three nearly equidistant reddish-brown clouds run across the wing, one near the base, one in the middle, and the third at the hind margin; in the spaces between these are too leaden grey spots of irregular form, that before the middle being the darkest, and a leaden grey line runs along the hind margin; cilia greyish-ochreous, intersected by three darker lines. Posterior wings whitish, tinged with pale-brown towards the apex, with pale-ochreous cilia.

I have before me a single specimen, taken by Mr. Atkinson near Calcutta.

5. *Depressaria Ricini*, Atkinson, in litt.

Alis anticis sulphureis, costa pone medium aurantia, puncto obsoleto disci pone medium, punctisque marginis postici, griseis.

Exp. al. 8 lin.

A pretty and very distinct species, easily recognizable by the above characters.

Head and face pale sulphur-yellow. Palpi whitish; tip of terminal joint dark-fuscous. Antennæ pale-brown, strongly ciliated.

Anterior wings pale sulphur-yellow, with the costa narrowly orange from before the middle to the apex; on the inner margin near the base is a faint pale grey cloud, and on the disc beyond the middle is a very indistinct grey dot; a row of grey dots runs along the hind margin; cilia whitish-sulphur. Posterior wings whitish, with the cilia a little darker.

Larva green, with the head black; feeds on the castor-oil plant, *Ricinus communis*, rolling up the edge of a leaf.

I have before me a single specimen, collected by Mr. Atkinson near Calcutta.

6. *Depressaria Zizyphi*, Atkinson.

Alis anticis brunneo-ochreis, basi saturate fusca, punctis fuscis oblique transversis, tribus ante, et tribus pone medium, e squamis elevatis compositis, macula subapicali nigricante.

Exp. al. $6\frac{1}{2}$—7 lin.

This appears to be a real *Depressaria*, though aberrant in the structure of the palpi, and in the tufts of raised scales on the ante-

rior wings; it cannot readily be confounded with any known species.

Head brownish-grey; face paler. Palpi pale greyish-ochreous; the end of the second joint brownish; terminal joint ochreous-brown at the base, and with a black ring before the tip, much thickened with loose projecting scales. Antennæ thick, about three-fourths the length of the anterior wings.

Anterior wings brownish-ochreous, with a dark-brown patch at the base; before the middle are three tufts of dark scales obliquely placed, and beyond the middle are three nearly similar tufts, but the costal and subcostal one are larger and darker than that on the fold; before the apex lies a small blackish spot, a streak from which runs into the apical cilia; cilia otherwise ochreous. Posterior wings brownish, with a faint coppery gloss; cilia greyish.

Larva green, with the head dark-brown; feeds on *Zizyphus Jujuba*.

Collected by Mr. Atkinson near Calcutta.

7. *Depressaria*? *Ricinella*, Atkinson.

Alis anticis truncatis ochraceis, punctis sparsis fuscis; macula saturate fusca disci ante medium; alis posticis albidis.

Exp. al. 9—11 lin.

This is not a true *Depressaria*, the abdomen not being flattened, and the second joint of the palpi being slender, in both which respects it resembles *Orthotælia*, but the greater length of the palpi, as long as in *Phibalocera*, and the different habit of the larva, remove it from *Orthotælia*; the length of the antennæ, little more than half that of the anterior wings, easily distinguishes it from *Phibalocera*. It has a superficial resemblance with *Depressaria arenella*.

Head and face ochreous. Palpi long, thin, recurved, the second joint not incrassated, ochreous, with a brown tinge along the sides; terminal joint ochreous, with a brown ring at the base. Antennæ of the male pubescent.

Anterior wings gradually increasing in breadth to beyond the middle, then becoming slightly narrower, the hind margin truncate, ochreous, with numerous small brown spots, and a larger darker spot on the disc before the middle; towards the apex is frequently a curved row of brown dots; hind margin spotted with brown; cilia pale ochreous. Posterior wings whitish, with a few brown dots on the apical margin; cilia whitish-ochreous.

Larva bright-green; the head and second segment black; feeds on the castor-oil plant (*Ricinus communis*) in September, rolling up the edges of the leaves.

Collected by Mr. Atkinson near Calcutta.

8. *Gelechia*? *Hibisci*, Atkinson, in litt.

Alis anticis griseis, linea humerali, macula magna dorsali, macula parva disci pone medium, apiceque saturate rufo-brunneis.

Exp. al. 5—6 lin.

By the palpi and hind wings a *Gelechia*, but aberrant by the produced apex and concave hind margin of the anterior wings; the dark blotch on the inner margin reminds one of an *Anchylopera*.

Head and face grey. Palpi, second joint grey, terminal joint brownish-ochreous, with a paler ring in the middle and pale tip. Antennæ grey, with pale ochreous annulations.

Anterior wings grey, with some clouds and dashes of ochreous, and with a short red-brown streak from the base along the subcostal nervure; on the inner margin is a large semi-circular chocolate-brown blotch edged with pale ochreous; beyond it is a small, nearly round spot of the same colour on the disc, edged and intersected with pale ochreous; beyond the middle of the costa a slender whitish-ochreous line goes obliquely to the hind margin just above the anal angle; the apical portion of the wing beyond it is entirely chocolate-brown, but intersected longitudinally by three ochreous lines; the apex of the wing is produced and slightly hooked; cilia ochreous, except the tips of the cilia at the actual apex, which are brown. Posterior wings greyish-brown, with paler cilia.

Larva small, green, with the head black; it feeds on the tops of the yellow *Hibiscus*. The perfect insects appeared in July, 1856.

Collected by Mr. Atkinson near Calcutta.

9. *Gelechia*? *pubescentella*, n. sp.

Alis anticis lucidis dilute griseo-fuscis, puncto saturatiore disci pone medium subobsoleto; antennis (♂) distincte ciliatis.

Exp. al. $4\frac{1}{2}$ lin.

This would seem to be related to the *Cinerella* group of the genus *Gelechia*, both in the form of the anterior and the posterior wings, but the strongly ciliated antennæ would appear almost to require its being separated generically.

Head, face and palpi greyish-ochreous. Antennæ brown, strongly dentate, and with long brownish cilia.

Anterior wings shining pale greyish-brown, with an indistinct darker dot on the disc beyond the middle; cilia rather paler than the wings. Posterior wings pale grey, with greyish-ochreous cilia.

I have before me four specimens (all males), collected by Mr. Atkinson near Calcutta.

10. *Gelechia simpliciella*, n. sp.

Alis anticis ochraceis, dorsum versus fuscescenti-suffusis, puncto disci pone medium nigro, punctis fuscis plicæ subobsoletis, margine postico fusco-punctato.

Exp. al. $5-5\frac{1}{2}$ lin.

An inconspicuous-looking insect, but not closely allied to any known species.

Head and face yellowish-ochreous. Palpi greyish-ochreous, edged with brownish externally. Antennæ brownish-ochreous or brownish.

Anterior wings ochreous, palest along the costa, more or less suffused with brownish towards the inner margin; on the disc, beyond the middle, is a conspicuous blackish dot, and on well-marked specimens a few brownish dots may be traced along the fold; hind margin dotted with brown; cilia ochreous. Posterior wings with the apex very slightly produced, pale grey, with greyish-ochreous cilia.

This species appears rather variable; one specimen, which I cannot consider distinct, has the anterior wings *entirely suffused with brownish*, and *two* conspicuous black dots on the disc, with two *almost equally distinct* on the fold.

I have before me three pale specimens, and one of the dark variety; they were collected by Mr. Atkinson near Calcutta.

11. *Gelechia marginipunctella*, n. sp.

Alis anticis niveis, costa et dorso fusco-punctatis, atomisque fuscis irroratis.

Exp. al. $4\frac{1}{2}$ lin.

A very distinct and easily recognized species.

Head and face white. Palpi white, with a black spot at the base, and a brown spot near the tip of the second joint, and a brown ring at the base, and a brown spot below the tip of the terminal joint. Antennæ pale brown.

Anterior wings narrow, white, sparingly dusted with brownish scales, and with some small brownish spots along the costa and inner margin, and a few along the disc; cilia whitish. Posterior wings pale grey, with whitish cilia.

I have before me a single specimen, taken by Mr. Atkinson near Calcutta.

12. *Parasia? apicipunctella*, n. sp.

Alis anticis sordide ochreis, saturatius venosis, atomis sparsis nigris, puncto transversali nigro disci ante medium.

Exp. al. 6 lin.

Hardly a true *Parasia*, the anterior wings being too pointed, and the apex of the posterior wings not sufficiently produced, yet the palpi are recurved, and the terminal joint is thickened with scales almost to the extreme tip.

Head and face greyish-ochreous. Palpi greyish-ochreous; the terminal joint densely clothed with ochreous scales, with a brownish spot towards the tip, the extreme tip naked. Antennæ greyish-ochreous.

Anterior wings dull-ochreous, veined with darker, with some scattered blackish atoms, and an elongate black dot on the disc before the middle; a row of black dots goes round the acute apex; cilia ochreous. Posterior wings pale grey, darker at the base, with ochreous cilia.

I have before me one specimen, taken by Mr. Atkinson near Calcutta.

13. *Œcophora subganomella*, n. sp.

Alis anticis sordide griseo-ochreis, punctis tribus nigris, uno plicæ, duobus disci, margineque postico nigro-punctato.

Exp. al. 5 lin.

This insect reminds one excessively of *Tinea Lappella*, but is of a paler greyer colour, and of course structurally different.

Head, face and palpi greyish-ochreous; antennæ rather thick, brownish.

Anterior wings pale greyish-ochreous, with three black dots, one on the fold, one rather beyond it on the disc before the middle, the third on the disc beyond the middle; the hind margin is dotted with black; cilia pale greyish-ochreous. Posterior wings shining pale grey, with pale greyish-ochreous cilia.

I have before me one specimen, taken by Mr. Atkinson near Calcutta.

14. *Butalis triocellata*, n. sp.

Alis anticis purpureo-griseis, dilute ochreo-punctatis, striatisque, vitta dorsali fusca, maculis tribus disci brunneis, ochreo-cinctis.

Exp. al. 7—8 lin.

Not closely allied to any known species, and perhaps, considering the form of the abdomen, hardly a true *Butalis*, but the ovate form of the posterior wings prevents its being associated with *Gelechia*. It varies a little in size, but not otherwise.

Head and face greyish-ochreous. Palpi slender, recurved, not long. Antennæ brownish.

Anterior wings purplish-grey, spotted and streaked with yellowish-ochreous, with the inner margin brownish, and with three oval brown spots edged with pale ochreous, in the middle of the wing, the first and third on the disc, the second on the fold; a dark brown line runs round the apex of the wing; cilia pale ochreous. Posterior wings brownish-grey, with paler cilia.

Abdomen greyish-ochreous.

Taken by Mr. Atkinson, near Calcutta, on the trunk of *Nauclea Orientalis*.

15. *Gracilaria*? *auricilla*, n. sp.

Alis anticis brunneis, dilute ochraceo-marmoratis, maculis duabus costæ pone medium nigris, apice aureo, dorso squamis brunneis tridentato.

Exp. al. 3¾ lin.

A singular insect, combining the characters of *Gracilaria* and *Chauliodus*. By the form of the wings and antennæ it would certainly be a *Gracilaria;* the maxillary palpi are slightly developed, but the labial palpi seem scarcely pointed enough for *Gracilaria;* the three distinct tufts of scales projecting from the inner margin of the anterior wings remind one excessively of *Chauliodus;* the markings of the anterior wings are peculiar, and the tawny golden apex is nearly the colour of that in *Lithocolletis Messaniella*.

Head dark grey-brown, face more ochreous. Maxillary palpi pale ochreous; labial palpi dark brown, a pale spot at the base and tip of the terminal joint. Antennæ much longer than the anterior wings, brown, with pale annulations, the apical third paler.

Anterior wings brown, marbled with pale ochreous, and with three or four semi-distinct pale ochreous transverse lines; the

costa spotted with dark brown, or black, two spots beyond the middle being very conspicuous; along the inner margin are three distinct tufts of brown scales; the entire tip of the wing of a tawny-golden colour, intersected by a slender angulated silvery fascia, and spotted along the costa with whitish-yellow and blackish, and with a bluish-silvery hinder marginal line; cilia greyish-brown, with a few long black scales projecting at the apex. Posterior wings brown, with yellowish brown cilia.

I have before me two specimens, collected by Mr. Atkinson, near Calcutta.

16. *Gracilaria? falcatella*, n. sp.

Alis anticis brunneis, basim versus saturatioribus, linea transversali dilute ochrea prope basim, macula dorsi media nigricante ochreo-circumcincta, linea ochrea ab angulo anale ad apicem ducta, margine postico nigricante.

Exp. al. 4 lin.

This rather obscure looking insect has much superficial resemblance with *Coriscium orientale*, but differs essentially in the structure of the palpi. I am doubtful whether it be a true *Gracilaria;* the antennæ of the only specimen I have before me are broken, but the falcate apex of the anterior wings is very discordant from all known *Gracilariæ* except *G.? ustulatella*, the precise position of which is also doubtful. In some respects it reminds one of *Pyroderces argyrogrammos*, but the palpi are too short.

Head pale brown; face whitish ochreous. Palpi whitish, no trace of a tuft to the second joint, terminal joint with three black rings. Antennæ dark brown, annulated with pale ochreous.

Anterior wings brown, with a darker blotch at the base, bounded externally by a wavy transverse pale ochreous line; on the middle of the inner margin is an irregular brown-black blotch, edged with pale ochreous, and a curved pale ochreous line runs from the anal angle to the apex, beyond it the hind margin is dark brownish-black; apical cilia brownish, intersected by two curved blue lines; cilia below the apex dark grey. Posterior wings dark grey, with dark grey cilia.

I have before me only a single specimen, taken near Calcutta by Mr. Atkinson.

17. *Gracilaria? ustulatella*, n. sp.

Alis anticis ochraceo-griseis, dorso fusco-punctato, fasciis obliquis duabus fuscis, ciliis apicis ustulato-violaceis.

Exp. al. $2\frac{3}{4}$ lin.

Not a true *Gracilaria*, the maxillary palpi being scarcely visible, and the hind margin of the anterior wings rather falcate; in general appearance it reminds one much of a dwarf *Chauliodus Chærophyllellus*, but there are no tufts of scales projecting on the inner margin, and the antennæ are nearly twice the length of the anterior wings.

Head greyish-ochreous; face and palpi white; antennæ brownish, spotted with yellow on the back, beneath entirely yellowish.

Anterior wings greyish-ochreous, spotted with brownish along the inner margin, and with two oblique brownish fasciæ, one before the other beyond the middle; the cilia of the hind margin are shot with orange-brown and violet, appearing in some positions of the one colour, and in other positions of the other tint; cilia of the inner margin grey. Posterior wings pale grey, with greyish-brown cilia.

Hind legs and tarsi whitish, spotted with dark brown.

I have before me a single specimen, taken near Calcutta by Mr. Atkinson.

18. *Ornix? albifrons*, n. sp.

Alis anticis fuscis, dorsum versus albis, strigulis tribus costæ, tribus dorsi obliquis albis, apice ustulato, puncto nigricante.

Exp. al. $3\frac{1}{2}$ lin.

Probably this should form a new genus intermediate between *Ornix* and *Lithocolletis;* it differs from both in the face being rough.

Head and face white; palpi white; antennæ whitish-grey.

Anterior wings pale brownish, with the inner margin white, and with three pair of oblique white streaks from each margin, meeting in the centre of the wing; the first two pair are placed very obliquely, but the third pair is less so and is followed by a curved transverse silvery line; the apical portion of the wing is occupied by a tawny patch, in which is a darker central spot; cilia white, but intersected by a dark grey line going round the apex (as in *Lithocolletis*). Posterior wings pale grey, with paler cilia.

I have before me one specimen, taken by Mr. Atkinson, near Calcutta.

19. *Cosmopteryx Asiatica*, n. sp.

Alis anticis brunneis, fascia ænea prope basim, fascia violacea atro-marginata in medio, maculis duabus suboppositis violaceis

atro-marginatis pone medium, spatio inter has et fasciam interjecto aurantio, strigulaque apicis violacea.

Exp. al. $3\frac{1}{4}$ lin.

This belongs to the *Drurella* group, but is readily distinguished by the brown ground colour of the anterior wings, and the second violet fascia being divided into two opposite spots.

Head brassy-brown; face whitish-green; palpi whitish-grey, with a broad dark ring below the tip of the terminal joint; antennæ brown, annulated with yellowish, the rings towards the apex broad and strongly contrasted.

Anterior wings brown; not far from the base is a bronzy fascia, which really consists of three bronzy longitudinal lines, that next the costa being the longest; in the middle of the wing is a straight violet fascia edged with black, beyond it is a broad orange patch, and then follow two violet spots edged with black, that on the costa being decidedly posterior to the dorsal spot; the apical portion of the wing is black, with a whitish-violet streak running into the extreme apex; cilia blackish. Posterior wings dark grey, with grey cilia.

I have before me two specimens, collected by Mr. Atkinson, near Calcutta.

20. *Cosmopteryx? semicoccinea*, n. sp.

Alis anticis basim versus coccineis viridi-griseo lineatis, postice luteis.

Exp. al. $5\frac{1}{2}$ lin.

A pretty species, but of rather uncertain location; neither the anterior nor the posterior wings are narrow enough for a true *Cosmopteryx*.

Head greyish-ochreous; face pale ochreous; palpi pale ochreous, terminal joint with a brown line externally and a brown ring below the apex; antennæ brown along the back, spotted with pale ochreous, beneath entirely pale ochreous.

Anterior wings scarlet at the base, the apical half pale yellowish; the basal portion is streaked longitudinally with greenish-grey, one streak running along the costa, one along the inner margin, one along the fold, and two others go obliquely from the costa to the fold; the scarlet portion of the wing extends rather beyond the middle, and is bounded by a silvery-yellowish line; in the yellow portion of the wing are two small black spots on the costa; cilia ochreous-grey. Posterior wings pale grey, with greyish cilia.

I have before me one specimen, taken by Mr. Atkinson, near Calcutta.

21. *Cosmopteryx? æneella*, n. sp.

Alis anticis æneis, basi, fasciaque ante medium dorsum versus dilatata, dilute luteis.

Exp. al. 6 lin.

This species only appears to differ from *Cosmopteryx* in the greater breadth of the anterior wings; it reminds one considerably of *Stathmopoda pedella*, but the resemblance is only superficial, as in the structure of the legs and antennæ the insect appears to be a true *Cosmopteryx*.

Head and face brassy brown; second joint of the palpi pale yellowish, terminal joint brownish; antennæ brownish.

Anterior wings bronzy, greenish towards the base, posteriorly browner; at the base itself is a narrow pale yellow fascia, and before the middle is another broader yellow band, which is almost triangular, being much broader on the inner margin than on the costa; in the apex of the wing there is faint indication of a dark streak, with a pale streak below it; cilia brownish-grey. Posterior wings brown, with greyish-brown cilia.

I have before me one specimen, taken by Mr. Atkinson, near Calcutta.

Lozostoma, n. g.

Head smooth; face concave, retreating, with a fillet on the top between the antennæ; palpi short, drooping; antennæ rather thick, but simple; the basal joint thickened.

Anterior wings narrow and pointed behind; posterior wings lanceolate.

A pretty genus, belonging to the family *Elachistidæ*. I have before me single specimens of two species, *Flavofasciata* and *Semisulphurea*, collected by Mr. Atkinson, near Calcutta.

22. *Lozostoma flavofasciata*, n. sp.

Alis anticis saturate purpureis, fascia media late flava.

Exp. al. 4 lin.

Head greenish-brown, rather metallic; face white, the fillet greenish-white; palpi white; antennæ greyish-brown.

Anterior wings dark purple, more greyish at the base, with a broad dark yellow fascia nearly in the middle, very nearly straight, but rather nearer the base on the inner margin than on the costa. Posterior wings coppery-brown, paler at the base.

23. *Lozostoma semisulphurea*, n. sp.

Alis anticis basim versus sulphureis, postice ochraceo-fuscis, linea transversa media nigricante.

Exp. al. 5 lin.

Head greyish-brown; face whitish, the fillet whitish; palpi white; antennæ very pale greyish-brown.

Anterior wings sulphur-coloured at the base, with a short brown streak along the costa at the base; nearly in the middle of the wing is a slender transverse blackish line, slightly oblique, and in it towards the costa are two or three bluish-white scales; the apical half of the wing is yellowish-grey-brown; cilia paler. Posterior wings pale brownish, with paler cilia.

ATKINSONIA, n. g.

Head smooth, broad, flat; labial palpi long, slender, recurved, terminal joint rather longer than the second joint. Antennæ stout, clothed on one side with long loose scales, nearly to the tip.

Anterior wings broadest beyond the middle, the costa being at first slightly concave; posterior wings narrow and pointed. Abdomen broad, depressed, with long scales at the side. Legs, especially the hind pair, with long tufts of scales.

A singular and beautiful genus, belonging to the family *Elachistidæ*.

24. *A. Clerodendronella*, Atkinson, in litt.

Alis anticis cupreo-rufis; alis posticis dilutioribus, griseo-ciliatis.

Exp. al. 6—6½ lin.

Head and face purple. Second joint of the palpi reddish-orange, terminal joint purple. Antennæ purple-black, densely clothed along one side with long purple-black scales.

Anterior wings brilliant coppery-red, with the cilia greyish. Posterior wings reddish-orange, with grey cilia.

Thorax coppery-red. Abdomen blue-black, with a slender whitish belt nearly in the middle.

Legs black, spotted with white; the hind legs with the spines replaced by thick tufts of black scales; the tarsi also much thickened with black scales.

"Larva dirty brown; head dark reddish-brown; second segment black. It feeds in the tops of *Clerodendron*, drawing together the leaves with a white web."

" The perfect insects made their appearance on the 27th July, 1856; the insect when at rest erects its beautifully plumed hind legs above its back, behind the head, and keeps constantly vibrating its incrassated antennæ."

Collected near Calcutta, by Mr. Atkinson.

25. *Laverna*? *Mimosæ*, n. sp.

Alis anticis brunneis, dorso anguste albo; alis posticis purpureis.

Exp. al. 6—8 lin.

Though this insect has so much the appearance of *Laverna atra*, it must really be generically distinct; the form of the palpi is quite unknown amongst the *Elachistidæ*, reminding one most strongly of the palpi of the male of *Anarsia;* for the second joint is furnished with a dense projecting tuft of scales, and the terminal joint is not perceptible.

Head, face and palpi entirely dark brown; antennæ whitish.

Anterior wings rich dark brown, with a narrow white edging along the inner margin from the base to the apex; the outline of this edging is rather wavy; on the hind margin are some yellow scales; cilia yellowish-brown, intersected by two or three faint darker-brown lines. Posterior wings purple, sometimes edged with whitish towards the apex; cilia greyish-purple.

I have before me five specimens, bred by Mr. Atkinson from larvæ feeding in the seeds of *Mimosa Arabica;* the perfect insects made their appearance in December, 1856.

VII. *A Contribution to the History of* Stylops, *with an Enumeration of such Species of Exotic* Hymenoptera *as have been found to be attacked by those Parasites.* By Frederick Smith, Esq.

[Read Jan. 3rd, 1859.]

The principal object of the short communication which I now offer to the Entomological Society, is to make known the genera and species of such exotic *Hymenoptera* as have been observed to be infested by *Stylops*, or species belonging to allied genera.

I am not aware of any attempt having been recently made to collect materials for the purpose of ascertaining the geographical range of these interesting parasites;* and having myself obtained additional material for that purpose, I have thought it might prove interesting to the Society if I laid it before them in a collected form.

The first specimen on record of the genus *Stylops* was found by the Rev. William Kirby on *Andrena nigro-cænea*, and it appears remarkable that, as that species is very plentiful in the London district, and stylopized *Andrenidæ* by no means rare, that I should never have observed a specimen of *Andrena nigro-cænea* infested by the parasite.

In the neighbourhood of London, according to my observation, the species of *Andrena*, most commonly attacked, is *A. Trimmerana*, the female most frequently, but the male also occasionally. I possess twelve stylopized individuals of this species, four of which are of the male sex. By diligently collecting the bees belonging to the genus *Andrena*, I should expect to obtain nine or ten infected bees in a season, but should consider it quite probable that not one would produce a male *Stylops*—I should say, judging from my own experience in collecting in the neighbour-

* Mr. Westwood, in his Introduction to the "Modern Classification of Insects," published in 1842, has, in his valuable History of the *Strepsiptera*, brought together all that had been observed up to that period, and has added a great amount of new and interesting information.

hood of London, that not more than one male *Stylops* occurs to twenty females; supposing this to be the case, and that each female *Stylops* produced six thousand larvæ, which is within the calculation made by Mr. Newport in his "Natural History of the Strepsiptera," we should have a total result of one hundred and fourteen thousand larvæ of *Stylops*, and this from the nineteen individuals which we captured alone; were it not that few of these ever attain their perfect condition, surely our only difficulty would be to find a bee not infested by a parasite.

The explanation of this apparent difficulty will be perhaps best given to those who have not investigated the subject, if I relate my observations on a female of *A. Trimmerana*, which was infested by a female *Stylops*. The *Andrena* had been kept six or eight days in a box covered with fine net, she had been well supplied with fresh flowers, and was very active and apparently healthy; my notice was attracted by observing the bee running about apparently in a very excited state, burying herself beneath the leaves and flowers, then issuing forth and running round the sides of the box; sometimes she would stop, bury her head in the petals of a *Dandelion*, and then commence brushing herself with her posterior legs, passing them quickly over the upper surface of the abdomen; these unusual movements on the part of the bee led me to examine her more closely. I then found that she was covered with hundreds of the larvæ of *Stylops*, and her brushing and excitement was caused by efforts, on her part, to free herself from the annoyance which the host of larvæ evidently occasioned her. There can be little doubt of hundreds, nay, thousands of the larvæ being brushed off in situations, where, from want of sustenance, they of necessity perish; whilst others, falling into the petals of flowers, may attach themselves to bees which subsequently visit them to extract their sweets; whilst others, fixing themselves to insects of other orders, are removed from the chance of finding a situation in which proper sustenance would enable them to attain a state of maturity.

Although *Stylops* is at present considered a rare insect, particularly the male, I have no doubt it will be found in abundance when once the proper locality is discovered and diligently searched by a competent Entomologist. I have never had the good fortune to discover a colony of *Andrena convexiuscula*, a bee which appears to be always infested, or I feel pretty certain I should have obtained *Stylops* in plenty. All the specimens which I possess of *A. convexiuscula*, those in the National Collection, and all which

I have seen in other cabinets, are invariably attacked. I therefore imagine the discovery of a colony of that species of *Andrena* is all that is requisite to supply *Stylops* in abundance.

The following is a list of British *Andrenidæ*, which I have observed to be subject to the parasitic attacks of *Stylops* :—

Halictus minutus, ♀.
——— *nitidiusculus*. ♀.
——— *longulus*. ♀.
Andrena bicolor. ♂, ♀.
——— *Trimmerana*. ♂, ♀.
——— *nitida*. ♂, ♀.
——— *varians*. ♂.
——— *xanthura*. ♂.
——— *Afzeliella*. ♂.
——— *fuscata*. ♀.
——— *chrysosceles*. ♀.
——— *convexiuscula*. ♂, ♀.

It will be seen by this list that none of the species which are very pubescent, or have the segments thickly fringed with pubescence, have been observed to be infested, although such would appear to be the species most likely to collect the larvæ when visiting those flowers which contain them.

The only specimens of *Andrenidæ* which I have seen infested, not British or Continental, are a male and female *Andrena* from East Florida, closely allied to the European *A. chrysosceles ;* the head and thorax of two female *Stylops* protrude from beneath the fourth segment of the abdomen of the female, and one from beneath the fifth segment of the other sex, a male *Stylops* having emerged from beneath the second segment. I have also seen a single specimen of an *Andrena* from East Florida infested by a single female *Stylops*, and three specimens of *Andrena victima* from Nova Scotia. Specimens of *Polistes Gallica*, infested by *Xenas vesparum*, are to be seen in most collections of *Hymenoptera*, and possess an additional interest, from the fact of the celebrated Rossi having first discovered these remarkable insects infesting that genus of wasps.

Fam. SPHEGIDÆ.

Species of the genus *Ammophila* appear to be particularly subject to the attacks of *Stylopidæ*. I have observed the following :—

Ammophila holosericea, ♀, from Sicily. A male parasite having

escaped from beneath the second abdominal segment, a female still protruding from beneath the same; the third segment has the pupa case of an escaped male beneath it, and the fourth is distorted by the head and thorax of a female parasite.

Ammophila ———? ♂, from Tunis. The abdomen is greatly distorted by the pupa case of an escaped male parasite; judging from the size of the case, I should conclude the *Stylops* to be four times the size of *S. Melittæ*.

Ammophila ferrugineipes, ♀, Gambia. The abdomen distorted by the pupa case of an escaped *Stylops* from beneath the third segment.

Sphex petiolata, ♂, Brazil. The head of a very large female *Stylops* beneath the fifth abdominal segment.

Sphex flavipes, ♀, Georgia. The fourth segment distorted by the pupa case of an escaped male *Stylops*.

Pelopœus Chiliensis, ♀. The pupa case of an escaped male beneath the fourth abdominal segment.

Pelopœus laboriosus, ♀, Aru Island. Two female *Stylops* beneath the fourth segment of the abdomen.

Pelopœus difformis, from Shanghai. Has a female *Stylops* protruding from beneath the third abdominal segment.

Pelopœus ———, from Celebes. Attacked by a female *Stylops*.

Belonogaster juncens, from Tripoli. Attacked by a female *Stylops*.

Vespidæ.

Eumenes petiolata, ♀, India. The abdomen of the third segment with a female *Stylops* beneath it, and the fourth distorted by the pupa case of an escaped male.

Odynerus ———? ♀, Brazil. The abdomen greatly distorted by a male *Stylops* protruding beneath the third segment.

Polybia sericea, ♀, Brazil. A female protruding beneath the fourth segment.

Polistes Americanus, ♀, N. America. The abdomen much distorted by a male *Stylops* having escaped from the pupa case, which projects from beneath the fourth segment.

Polistes instabilis, ♀, Brazil. The abdomen distorted by the pupa case of a male *Stylops* beneath the fourth segment, and the head of a female beneath the fifth segment.

The foregoing enumeration of species, and the localities from whence they were derived, shows that *Stylops* and its affinities, or rather allies, have a wide geographical range. Some of the parasites must be insects of considerable size, as compared with the British species; judging from the size of the pupa cases, I should expect that the expansion of wing of the *Stylops* infesting *Polistes instabilis* could not be much less than eight lines, or two-thirds of an inch.

I have not observed any insect from the Australian continent or New Zealand infested by *Stylops*.

	Authority.	Britain.	Europe.	Asia.	Africa.	North America.	South America.	Tasmania.
Halictus minutus. ♀	Smith	*						
,, *nitidiusculus.* ♀	Smith	*						
,, *longulus.* ♀	Smith	*						
,, *æratus.* ♀	Dale	*						
Andrena labialis. ♀	Dale	*						
,, *nigro-ænea.* ♂, ♀ ..	Kirby	*						
,, *tibialis.* ♂, ♀	Pickering	*						
,, *bicolor.* ♂	Smith	*						
,, *Trimmerana.* ♂, ♀ .	Smith	*						
,, *fulvicrus.* ♀	Pickering	*						
,, *Collinsonana.* ♀ ...	Pickering	*						
,, *convexiuscula.* ♂, ♀.	Pickering	*						
,, *Afzeliella.* ♂, ♀ ...	Pickering	*						
,, *nitida.* ♂, ♀	Smith	*						
,, *varians.* ♂	Smith	*						
,, *xanthura.* ♂	Dale	*						
,, *fuscata.* ♀	Smith	*						
,, *chrysosceles.* ♀	Smith	*						
,, *parvula.* ♀	Smith	*						
,, *Gwynana.* ♂	Smith	*						
,, *similima?* ♀, ♂ ..	Smith	..	..	..	..	E. Florida.		
,, *victima*	Smith	..	..	..	..	Nova Scotia.		
,, ———	Sowerby	..	..	..	..	Nova Scotia.		

,, ——— ?	Lewis	..	..	..	..	..	..	Tasmania ?
Bombus museorum ?	Templeton	*						
Ammophila sabulosa. ♀	Leon Dufour	..	*					
,, *holosericea*. ♀	Smith	..	*					
,, ———. ♂	Smith	..	..	..	Tunis.			
,, *ferrugineipes*. ♀	Smith	..	..	..	Gambia.			
Sphex ———	Templeton	..	..	..	..	..	Rio Janeiro.	
,, *petiolata*. ♂	Smith	..	..	..	..	..	Brazil.	
,, *flavipes*. ♀	Smith	..	..	..	..	Georgia.		
Pelopœus Chiliensis. ♀	Smith	..	..	..	..	..	Chili.	
,, *laboriosus*. ♀	Smith	..	..	Aru Isl.				
,, *difformis*. ♀	Cab. Brit. Mus.	..	..	Shanghai.				
,, *intrudens*. ♀	Cab. Brit. Mus.	..	..	Celebes.				
VESPIDÆ.								
Eumenes petiolata. ♀	Smith	..	..	India.				
Odynerus auctus	Van Heyden	..	*					
,, ——. ♀	Smith	..	..	..	..	..	Brazil.	
Belonogaster junceus. ♀	Cab. Mus. Brit.	..	..	..	..	..	* *	
Polistes Gallica	Rossi	..	*					
,, *fuscata*	Peck	..	..	..	..	*		
,, ———	Templeton	..	..	..	Mauritus.			
,, *Americanus*	Smith	..	..	..	..	*		
,, *instabilis*	Smith	..	..	..	..	..	Brazil.	
Polybia sericea	Smith	..	..	..	..	..	Brazil.	
Vespa vulgaris	Van Rozer	..	*					

VIII. *A Revision of the British Species of* Corticaria. By G. R. Waterhouse, Esq., F.Z.S., &c.

[Read Jan. 3rd, 1859.]

1. *Corticaria pubescens.* C. oblonga, convexa, longius pubescens, antennis pedibusque flavescentibus; thorace cordato, supra densius punctato, postice foveolato, lateribus denticulato; elytris amplis, crebre seriatim punctatis.

Long. $1\frac{1}{4}$ lin.

Latridius pubescens (Illiger), Gyll. Ins. Succ. iv. 123, 1.
Corticaria ———, Steph. Illustr. iii. 106, 1; Manual, 129, 1047, and Collection.
——— ———, Mannerh. Germ. Zeitschr. v. 17, 1.
——— *punctulata*, Marsh., Ent. Brit. 109, 8.*
——— ———, Kirby's Collection.

The largest of the British species, and further distinguished by its smallish short cordiform thorax, and ample elytra with closely packed rows of punctures. The anterior tibiæ are quite straight and simple in both sexes, and there is no difference in the anterior tarsi indicative of sexual distinction—or at least it is very indistinct—for in some specimens I fancy I have noticed the basal joint is rather larger than in others. The antennæ have the joints more elongated than in the species next to be noticed. Its colouring varies considerably: most commonly the head and thorax are fusco-ferrugineous, the elytra piceous, becoming paler in the region of the shoulders. Sometimes the whole insect is piceous

* It is not my intention here to enter into the question of priority of names, &c.; I have retained throughout this paper the names most commonly used, otherwise I should have been inclined to apply Marsham's name to the present species. The oldest name given among the synonymes of this species is "*fenestralis*," of Fabricius, but there does not appear to be any good evidence that it really belongs to our insect; then next in date comes the name "*longicornis*" of Herbst, but as Herbst has given the same name to another species—a name universally adopted for that species—we would pass that over, and come to the next oldest name, and that is "*punctulata*" of Marsham. There can be no reasonable doubt about Marsham's species, which was published in 1802; whilst the name "*pubescens*" was published first by Gyllenhal in 1827.

(excepting the legs and antennæ), sometimes testaceous. The pubescence is of a dirty white hue.

Moderately common.

2. *Corticaria crenulata.* C. oblonga, convexa, longius pubescens, nigro-picea, antennis pedibusque flavescentibus; thorace subrotundato, coleopteris angustiore, lateribus denticulato, supra convexo, punctato, postice fovea impresso; elytris oblongo-ovatis, crebre seriatim punctatis.

Long. 1 lin.

Mas. femoribus incrassatis; tibiis anticis, intermediisque ad apicem intus sub-productis, extus oblique truncatis; tarsi antici articulo primo dilatato.

Latridius crenulatus (Schüppel), Gyll. Ins. Suec. iv. 125, 2.

Corticaria crenulata, Steph. Illustr. iii. 106, 2; Manual, 129, 1048.

——— ———, Mannerh. Germ. Zeitschr. v. 22, 6.

I possess specimens of this insect showing different shades of colouring from testaceous to brown, pitchy brown, and black (in the last the humerus is usually paler); but in the most common condition, the head and thorax are black, or nearly so, and the elytra rufous-brown, with the disc dusky.

Not uncommon in the neighbourhood of London, but most plentiful, according to my experience, near the sea, under decaying vegetable matter. Common at Southend.

Stephens has evidently taken his description of the present species (and indeed all other species of *Corticaria*, excepting *C. pallida*) from Gyllenhal, but in the diagnosis he has left out one word referring to the sculpturing of the elytra, and by so doing has omitted the very pith and marrow of the description. In the original the elytra are described as "confertim *punctato-striata*," and in the "Illustrations" the word "*confertim*" is left out. This is unfortunate, since it so happens that *C. crenulata*, *C. pubescens* (where the same omission has also been made) and *C. serrata* are three species which, though differing much in other respects, are pre-eminently distinguished by this peculiarity in the sculpturing, that instead of having about eight ordinary punctate striæ, they have about double that number of closely-packed rows of punctures, and the ordinary striæ are not distinguishable. In speaking of *C. serrata* these remarks should be slightly modified, for here the punctuation of the true striæ becomes rather more evident. In other British species the punctures of the interstices of the

striæ are remote and usually so minute that it becomes doubtful whether by noticing them one does not give them a prominence which is scarcely desirable. Gyllenhal, in describing some of these (*C. denticulata*, for instance), states that the interstices are impunctate, although, strictly speaking, such is not the case.

Under the name *C. crenulata*, stand in the Stephensian cabinet three insects; the first is *C. denticulata;* the second, *C. pubescens*, and the third, *C. crenulata*.

3. *Corticaria denticulata.* C. oblonga, convexa, brevius pubescens, nigro-picea, antennis pedibusque flavescentibus; thorace sub-rotundato, coleopteris angustiore, supra convexo, punctato, fovea postice impresso, lateribus subdenticulato; elytris oblongo-ovatis, plerumque fuscis, punctato-striatis, interstitiis convexiusculis, punctis minutissimis seriatim dispositis.

Long. 1 lin.

Mas. femoribus incrassatis; tibiis anticis, intermediisque ad apicem intus angulatim productis, extus oblique truncatis; tarsi antici articulo primo dilatato.

Latridius denticulatus (Schüppel), Gyll. Ins. Suec. iv. 126, 3.

Corticaria denticulata, Steph. Illustr. iii. 107, 3; Manual, 129, 1049 (not of Collection).

——— ———, Mannerh. Germ. Zeitschr. v. 23, 7.

This species has many characters in common with the preceding. In size and form there is scarcely any difference; in both, the thorax is about one-third narrower than the elytra at the broadest part; has the sides boldly rounded, and with the broadest part rather in front of the middle; but in *C. denticulata* the thorax is rather more attenuated behind than in *C. crenulata*, and the crenulations are less distinct. In the form of the head, and in the structure of the antennæ, there is no palpable difference. In the form of the elytra *C. denticulata* differs, in having the shoulders more gently rounded and the apex more obtusely rounded, but it is in the sculpture of these organs that a good distinction is perceptible. Here the elytra have about eight regular punctate striæ; the interstices are rather convex, and nearly impunctate.

In colouring, *C. denticulata* varies considerably, but in the most usual condition the head and thorax are black, and the elytra brown, with the region of the suture and the outer margin more or less dusky.

Stephens has transferred to the pages of the "Illustrations"

Gyllenhal's description of the present species, but he appears to have mistaken the *C. crenulata* for it, *C. denticulata* being represented in his Cabinet by two specimens of that insect.

Upon two or three occasions has the insect here described been sent from Germany as the *C. longicornis*, but *C. longicornis* is said to be a black insect, and the present species is very rarely black; and furthermore it would appear by the descriptions that *C. longicornis* is rather larger and has a longer thorax. It is always compared with *C. pubescens*, but is said to differ in having the interstices of the striæ impunctate. Such being the case, a comparison of the characters of *C. longicornis* with those of the *C. denticulata* is much to be desired.

I may here mention that, although *C. longicornis* is described in Stephens' works (the description being from Gyllenhal), other insects seem to have been mistaken for it, *C. longicornis* being represented in Stephens' Collection by one specimen of *C. pubescens*, and one of *C. denticulata*.

4. *Corticaria fulva*. C. elongata, convexiuscula, testacea, longius pilosa; oculis minus prominulis, nigris; thorace cordato, punctato, fovea rotundata postice impresso; elytris elongato-ovatis, striato-punctatis, interstitiis remote punctulatis.

Long. $\frac{5}{6}$—1 lin.

Corticaria fulva, Chevrier, Villa Catal. 1835, p. 45.
———————— Mannerh. Germ. Zeitschr. v. 42, 32.

The largest specimens of this insect are equal to *C. crenulata* in length, but the form is narrower; the thorax relatively smaller, and of a different form; the elytra have the shoulders more gently rounded, and the apex less acuminate. It is entirely testaceous (excepting the eyes, which are black) and clothed with rather long, whitish hairs. Head nearly one-third narrower than the thorax; the eyes smaller and less prominent than in most other species; forehead convex and somewhat remotely punctured; antennæ not differing perceptibly in structure from those of *C. crenulata*. Thorax but little broader than long; truncated in front, very gently rounded behind; the broadest part rather in front of the middle, where the sides are rounded, and from the middle to the hinder part the sides converge, so that at the hinder angles the width is reduced to about the same as it is at the insertion of the head; upper surface but moderately convex, and presenting a rather large, shallow fovea behind, and pretty thickly punctured;

the crenulations at the sides distinct. Elytra elongate-ovate; about one-fourth broader than the thorax, the shoulders gently rounded, the broadest part near the middle, the apex rounded: owing to the long hairs which cover the elytra, and the want of distinct striæ, the sculpturing of the elytra has a somewhat confused appearance, but careful examination shows that it consists of about eight rows of punctures, which, though moderately large, are by no means strong, and in parts they are somewhat irregular; in each of the interstices is a row of very minute punctures, which, for the most part, are remote from each other; on the basal part of the elytra minute transverse rugulæ are observable. The legs are moderate (the femora not incrassated in the males, such as we find them in *C. crenulata*); the anterior tibiæ are very gently bisinuate within and truncated at the apex externally in some specimens, which I take to be the males.

One specimen of this insect stands in Mr. Stephens' collection to represent the *C. elongata* of the "Illustrations," but it does not agree with the description there given, that description being taken from Gyllenhal, and referring to the *C. elongata* of that author. I have met with the present species upon several occasions, but unfortunately omitted to note down the localities, excepting of some few specimens which were taken recently by my sons in some hay left on the ground, in the precincts of the British Museum, where some horses had been fed.

5. *Corticaria serrata*. C. oblonga, convexa, fusco-ferruginea, breviter pubescens; thorace subrotundato, lateribus fortius denticulato, supra convexo crebre, sub-rugose punctato, fovea sat magna postice impresso; elytris oblongo-ovatis, plerumque piceis, crebre striato-punctatis, basi transversim rugulosis.

Long. $\frac{2}{3}$ lin.

Dermestes serratus, Paykul, Faun. Suec. i. 300, 31.
Latridius ———, Gyll. Ins. Suec. iv. 126, 4.
Corticaria serrata, Mannerh. Germ. Zeitschr. v. 28, 14.

Head but little narrower than the thorax; the eyes large and prominent; forehead moderately convex, punctured; antennæ scarcely equal to the head and thorax in length. Thorax rather broader than long, the sides rounded, and in such a manner that the broadest part of the thorax is rather in front of the middle; the denticulations (about eight in number) more acute and prominent than usual; the anterior angles rounded; the posterior armed

with one of the stronger lateral teeth; the posterior margin produced and rounded in the middle; the upper surface convex, thickly and sub-rugosely punctured, and with a large fovea behind. Elytra oblong ovate; at the shoulders (which are rounded) but little broader than the thorax at the broadest part; above convex, and with rows of punctures packed closely side by side, but among these the rows belonging to the ordinary eight striæ are distinguishable, the punctures being a little larger and more closely packed in the longitudinal direction than those of the interstices; on the basal part of the elytra the interstices are transversely rugulose. The rather short antennæ, as well as the legs, are rufo-testaceous.

Like most other species, this varies in colouring, being not unfrequently uniform dull rufous, but in full-coloured specimens the elytra are more or less pitchy, darker than the head and thorax. The small size, combined with the sculpturing of the elytra, and the strongly serrated sides of the thorax, will serve to distinguish this species. *C. crenulata*, which approaches it most nearly in the sculpturing of the elytra (see observations attached to that species) besides being about double the bulk, differs in having the thorax more ample, more regularly rounded, less strongly crenulate at the sides, the head proportionately smaller, the antennæ longer, and, in the male sex, has the thighs much incrassated, which is not the case in the present species.

I have found one specimen of this species in the nest of *Formica rufa* at Weybridge, but several other specimens, which I have taken at different times, were certainly not in ant's nests.

6. *Corticaria cylindrica.* C. sub-cylindrica, testacea, brevius pubescens; thorace sub-rotundato, antice truncato, lateribus crenato, supra punctato, postice foveolato; elytris elongatis, fortius punctato-striatis, interstitiis punctis sparsis adspersis, basi transversim rugulosis, marginibus plerumque infuscatis.

Long. $\frac{5}{6}$—1 lin.

Corticaria cylindrica, Mannerh. Germ. Zeitschr. v. 35, 23.
——— *borealis*, Wollaston, Append. to Zoologist, ccvi. (1855).

Among the British species this is certainly most near to the *C. serrata*, but it is readily distinguished by its larger size, clear testaceous colour, and by the almost impunctate interstices to the striæ of the elytra. The head is rather large, and the eyes, which

are black, are large and very prominent; the forehead convex and distinctly punctured; antennæ about equal to the head and thorax in length. Thorax a little broader than long, and but little broader than the head; the sides boldly rounded; the widest part rather in front of the middle; the crenulations distinct; upper surface distinctly, but not very thickly, punctured; the fovea behind small, and shallow. Elytra at the base scarcely as wide as the thorax at the broadest part, but becoming gradually wider to about the posterior third, where they are distinctly wider than the thorax; the apex rounded; the punctures of the striæ are rather strong and in parts somewhat irregular; the interstices with a few scattered punctures. Three out of four specimens in my Collection have the suture and outer margins of the elytra dusky; the fourth is entirely testaceous.

One of my specimens was found by me at Brockenhurst, in the New Forest, in September, 1856. I have no note of the localities of the others. Mr. Wollaston found his specimens on the coast of Durham.

7. *Corticaria elongata*. C. sub-linearis, depressa, testacea, pubescens; thorace transverso, elytrorum fere latitudine, supra puctulato, postice fovea transversa impresso; elytris punctato-striatis, interstitiis vix punctulatis.

Long. $\frac{3}{4}$—$\frac{5}{6}$ lin.

Latridius elongatus (Schüppel), Gyllenhal, Ins. Suec. iv. 130, 8.
Corticaria ferruginea, Marsh. Ent. Brit. 111, 15?
———— ————, of Kirby's Collection.
———— ————, of Stephens' Collection.
———— *elongata*, Stephens, Illustr. iii. 108, 7; Manual, 130, 1053.
———— ————, Mannerh. Germ. Zeitschr. v. 44, 35.

This species is readily distinguished by its linear, depressed form, and uniform pale colouring. Head narrower than the thorax; forehead rather convex and punctulated; eyes prominent, and black; antennæ about equal to the head and thorax in length. Thorax distinctly broader than long, and nearly equal to the elytra in width; truncated in front; the sides nearly straight and parallel, and obscurely crenulated behind; the anterior angles rounded, the posterior angles, right-angles; the hinder margin produced and rounded in the middle. Elytra moderately elongate, but little convex; the sides nearly parallel, the apex rounded; punctate-striate, the interstices each with a row of small pale hairs,

and a series of exceedingly minute and indistinct punctures. The anterior and middle tibiæ are slightly bent inward at the apex in the males, and the basal joint of the anterior tarsus is slightly enlarged.

Very common, and widely distributed.

Gyllenhal applies Marsham's name "*ferruginea*" to the species next to be described, stating that he has Kirby's authority for so doing; this is remarkable, since the *C. ferruginea* of Gyll. (a very uncommon insect with us) does not exist in Kirby's Collection, where the present species stands to represent the *C. ferruginea* of Marsham, as it does likewise in Stephens' Collection. There is no Marshamian specimen of either this or the next species in Stephens' Cabinet, and Marsham's description unfortunately does not serve to determine the insect, inasmuch as he uses the term "*ferruginea*" to denote its colouring; the present species being *testaceous*, and the next being *castaneous*. On the whole, however, I think it more probable that Marsham's description was intended for the common species; yet, since there may be a doubt, I think it better to adopt the names now universally used for the two insects.

8. *Corticaria ferruginea.* C. sub-linearis, depressa, castanea, capite nigricante; thorace sub-quadrato, postice foveolato; elytris subtiliter punctato-striatis, interstitiis subtilissime seriatim punctatis.

Long. $\frac{3}{4}$—$\frac{5}{6}$ lin.

Latridius ferrugineus, Gyll. Ins. Suec. iv. 131, 9.

Corticaria ferruginea, Steph. Illustr. iii. 108, 6; Manual, 130, 1052.

———— ————, Mannerh. Germ. Zeitschr. v. 45, 36.

———— *linearis*, of Stephens' Collection.

Scarcely longer, but decidedly broader than the preceding species, and further distinguished by its chestnut-brown hue and more delicate puncturing. Head pitchy black, rather narrower than the thorax; forehead convex, punctured; antennæ about equal to the head and thorax in length. Thorax subquadrate, rather broader than long; truncated in front; slightly contracted behind, the sides very gently rounded, obscurely denticulate anteriorly, and with about three stronger teeth behind, the last of which forms the posterior angle of the thorax; the hinder margin rounded; upper surface convex, rather thickly and finely punctured, and with a small fovea behind. Elytra about three times

the length of the thorax, but very little exceeding that segment in width; the sides nearly parallel; the apex rounded; the upper surface but little convex and very finely punctate-striate, with a row of excessively minute punctures between the striæ, from which spring minute hairs, which are scarcely visible, however, excepting under the microscope. Presents the same peculiarities of the tibiæ and anterior tarsi as in the preceding species.

Two specimens of this species stand in Stephens' Cabinet to represent the *C. linearis* of the "Illustrations," but the description there given is taken from Gyllenhal, and belongs to another insect, which is unknown to me as British. In Mr. Wollaston's Collection there are also specimens of this insect. I possess one or two old specimens, taken by myself many years back, but am unaware of the locality; others I have taken more recently in the corridors of the Crystal Palace upon two or three different occasions. It is rare, or very local.

9. *Corticaria gibbosa.* C. brevis, convexa, fusca; thorace angusto, fovea transversa, arcuata, impresso; elytris amplis, convexis, punctato-striatis, intersticiis punctis minutissimis, pilisque pallidis seriatim dispositis; antennarum basi, pedibusque testaceis.

Long. $\frac{2}{3}$ lin.

Mas. tibiis anticis intus ante apicem angulatim productis.

Dermestes gibbosus, Payk. Faun. Suec. i. 301, 32.
Corticaria impressa, Marsh. Ent. Brit. 100, 11; Steph. Collection.
——— *pallida*, Marsh. l. c. 112, 22; Steph. Illustr. iii. 109, 10; Manual, 130, 1056, and Collection.
Latridius gibbosus, Gyll. Ins. Suec. iv. 132, 10.
Corticaria gibbosa, Steph. Ill. iii. 109, 8; Manual, 130, 1054.
——— *similata*, Steph. Collection (not of description).
——— *gibbosa*, Mannerh. Germ. Zeitschr. v. 49, 40.
——— *sulcicollis*, of Kirby's Collection.

The smallest, and one of the commonest of the British species, and readily distinguished by its short form, combined with a narrow thorax, having a curved fovea towards the hinder part and extending almost to the lateral margin. The head is nearly as broad as the thorax, and has very prominent eyes. Thorax small in proportion to the elytra, about equal in length and breadth, the sides gently rounded, the broadest part rather in front of the middle, thence rather suddenly contracted towards the front, and more gradu-

ally contracted behind; the posterior angles obtuse; the hinder margin rounded. Elytra at the broadest part more than twice the breadth of the thorax, of a shortish ovate form, with the humeral angles rather prominent and rounded.

This insect stands in Stephens' Cabinet under the names "*impressa*," *pallida* (immature specimens) and *similata*; the last being regarded as the *similata* of Gyllenhal, has given rise, it would appear, to the introduction of that author's description into the "Illustrations." I have not met with any *Corticaria* which I could identify with Gyllenhal's description of *Latridius similatus*. Both in Stephens' and Kirby's Collections immature specimens of this insect are referred to the *Corticaria pallida* of Marsham.

10. *Corticaria Wollastoni.* C. oblongo-ovata, convexa, picea, antennis pedibusque testaceis; thorace angusto, subquadrato, lateribus ante medium paulo rotundato-ampliatis, angulis posticis rectis, supra crebrius punctato, postice transversim impresso; elytris fuscis, oblongo-ovatis, humeris prominulis, punctato-striatis, interstitiis convexiusculis, seriatim pilosis.

Long $\frac{5}{3}-\frac{7}{8}$ lin.

This species bears considerable resemblance to the *C. gibbosa*, but is much larger, and proportionately more elongate; the posterior angles of the thorax form right angles, the interstices of the striæ of the elytra are impunctate or very nearly so.

Head with the upper surface convex, rather distinctly but not very thickly punctured, the eyes prominent, giving to the head a width which is but little less than that of the thorax; antennæ testaceous, the club only somewhat tinted with fuscous, the joints rather more elongate than in *C. gibbosa*. Thorax but little broader than long, convex, the sides rounded on the fore part, but straight near the posterior angle, the broadest part rather in front of the middle, the fore part truncate, the hinder margin produced and rounded in the middle, the surface rather thickly punctured, and with a transverse depression behind, which is interrupted in the middle; elytra ample, oblong-ovate, with the humeral angle a little prominent, at the broadest part twice as broad as the thorax; paler than the head and thorax, but with the suture and outer margin more or less dusky; convex, and by no means strongly punctate-striate, the interstices at the base slightly convex, and, with a very strong lens, show a few scattered, and

extremely minute punctures, arranged in a line, in which same line is a series of minute pale hairs.

In the structure of the legs I can perceive no sexual distinction, such as exists in *C. gibbosa*, but it must be remarked that I have examined but six specimens of the supposed new species; these were found by Mr. Wollaston, at Mablethorpe.

The British Museum has received this insect from the Continent, under the name of *C. distinguenda* of Comolli, but according to the description of that insect, its thorax must be shorter, *i. e.* half as broad again as long. The *C. similata* must somewhat resemble the present species, but differs, according to the descriptions, in having the interstices of the striæ of the elytra rugulose. I can find no description of a *Corticaria* which is like *C. gibbosa* in most of its characters, but which differs in the same manner as the present insect.

11. *Corticaria fuscula.* C. breviter ovata, fusco-picea, thorace transverso, angulis posticis denticulo minuto armatis, supra crebre punctato, fovea sub-rotundata impresso; elytris fuscis, punctato-striatis, interstitiis convexiusculis, seriatim pilosis; antennaraum basi, pedibusque testaceis.

Long. $\frac{2}{3}$—$\frac{3}{4}$ lin.

Latridius fusculus (Megerle), Gyllenhal, Ins. Suec. iv. 133, 12.
Corticaria impressa, of Kirby's Collection.

Very like *C. gibbosa*, but readily distinguished by the form of the thorax, which is broad (about one-third broader than the head), transverse, has the sides boldly rounded, the widest part a little in front of the middle, the posterior angle armed with a minute tooth and thus rendered acute and prominent; this tooth, however, is not readily seen, excepting the thorax be separated from the body; instead of the curved groove, which in *C. gibbosa* extends nearly from side to side of the thorax, *C. fuscula* has only a fovea behind, and this is commonly transverse. The elytra scarcely differ from those of *C. gibbosa*—the striæ are perhaps usually rather stronger, and the intersticial punctures less so. In the most common condition the head and thorax are pitchy, or pitchy-brown, and the elytra brown, with the suture rather dusky; but, not unfrequently, the whole insect is brown; and, about the beginning of September this year, I found many specimens at South-end, which were entirely testaceous—no doubt from immaturity. In both the above-mentioned species minute transverse rugulæ

are seen on the basal part of the elytra, when viewed in a favourable light and position. The male of *C. fuscula* has a minute denticle near the apex of the anterior tibia on the inner side. This species is as common as the preceding. It is remarkable that this very common insect is not described by Stephens; it stands in his Cabinet under the name "*Sulcicollis*," and the description given in the "Illustrations," p. 109, sp. 9, which is taken from Gyllenhal's account of *Latridius transversalis* (see Gyll. iv. 133, 11), was evidently supposed to belong to this species; it, however, belongs to an insect of which I have seen no British example. In Stephens' "Systematic Catalogue," *C. sulcicollis* of Kirby's MSS. is given as = *L. transversalis* of Gyllenhal, but according to Kirby's Collection the insect is = *C. gibbosus* of Gyll., *C. impressa* of Kirby's Collection being = *L. fusculus* of Gyllenhal. I cannot think that Kirby is correct in referring this to the *C. impressa* of Marsham.

IX. *Descriptions of New Species of Phytophagous Insects.* *By* J. S. Baly, Esq.

[Read June 6th, 1859.]

Family CRIOCERIDÆ.

Genus Lema, Fabr.

Lema De Gandei.

Oblonga, convexa, nigra, nitida, abdomine rufo-piceo; elytris punctato-sulcatis, sulcis interruptis, profunde impressis; cæruleo-viridibus, margine flavo.

Long. 3½—4 lin.

Oblong, shining black; abdomen rufo-piceous; elytra bluish-green, their outer margin pale yellow. Head constricted behind the eyes; antennæ sub-filiform, two-thirds the length of the body, their second and third joints equal. Thorax subquadrate, scarcely broader than long; sides deeply constricted at their middle; above sub-cylindrical, impressed at the middle with a deep transverse groove, which is parallel with and terminates on either side in the lateral constriction; basal half of disc impressed by a deep longitudinal groove; surface smooth and shining, finely and remotely punctured. Scutellum triangular, shining black. Elytra much broader than the thorax, more than four times its length; above convex, each elytron covered with ten rows of deeply sulcate, punctured striæ; striæ much interrupted, interspaces elevated, smooth and shining; the outer stria entire; bright metallic bluish-green, the outer border broadly margined with pale yellow. Beneath shining black, abdomen rufo-piceous; legs slender.

Hab. Ecuador.

Lema variolosa.

Oblongo-elongata, rufo-fulva, nitida, antennis, thoracis vittâ centrali, postice abbreviatâ, scutello elytrisque nigris, his valde et irregulariter punctatis; punctis (præsertim ad latera) confluentibus, interstitiis valde elevatis; genubus, tibiis tarsisque piceis.

Long. 3 lin.

Oblong-elongate, convex above, shining rufo-fulvous; antennæ, a vitta on the thorax, the scutellum and the elytra black; knees, tibiæ and tarsi piceous. Head constricted behind the eyes; front with an oblique groove on either side; face transversely grooved just above the insertion of the antennæ; the latter slender, filiform, nearly equal in length to the body, their third joint obovate, nearly twice the length of the second. Thorax sub-quadrate; sides deeply constricted just behind their middle; above sub-cylindrical, deeply impressed in front of the base by a transverse groove, either end of which terminates in the lateral constriction; surface smooth and shining, impunctate, bright rufo-fulvous, a broad vitta down the centre, which gradually increases in width behind, and is abbreviated at the transverse groove, black. Scutellum shining black, its apex truncate. Elytra much broader than the thorax, oblong, convex, indistinctly depressed transversely below the base; shining black, whole surface irregularly covered with large deep variolose punctures, more crowded and confluent towards the sides; interspaces smooth and shining, much thickened and elevated, and forming towards the sides irregular reticulations. Beneath shining rufo-fulvous, abdomen covered with very short adpressed fulvous pubescence; the apex of jaws, the knees, tibiæ (their inner surface excepted) and tarsi pitchy black.

Hab. Sarawak, Borneo, collected by Mr. Wallace.

Lema Erycina.

Oblongo-elongata, nitido-rufo-fulva, pedibus elytrisque nigris, his apice rufo-fulvis; antennis extrorsum pallide fuscis.

Long. 4—4½ lin.

Oblong-elongate, shining rufo-fulvous; legs and elytra shining black; the apex of these latter rufo-fulvous. Head smooth, deeply constricted on either side behind the eyes, front impressed with a deep fovea; antennæ moderately robust, filiform, scarcely longer than half the body. Thorax as broad as long, sub-cylindrical, sides deeply constricted at their middle; above smooth and shining, impressed behind the middle with a shallow transverse groove, in the centre of which is a single fovea; a broad longitudinal line down the centre of the disc and a space on either side in front finely and sub-remotely punctured. Elytra oblong, transversely depressed below their base, the scutellary space slightly elevated; surface shining black, the apex rufo-fulvous; each elytron with ten rows of fine but distinct punctures; striæ

somewhat confused at their extreme apex, the outer stria deeply sulcate. Beneath rufo-fulvous, legs shining black; posterior thighs much shorter than the abdomen.

Hab. Old Calabar.

Lema cognata.

Oblonga, convexa, fulva, nitida; capite, scutello, pedibus, prothoracis basi infra, metathoraceque nigris.

Long. $2\frac{3}{4}$ lin.

Oblong, convex, shining fulvous; head, scutellum, legs, base of prothorax beneath, and the metathorax, shining black. Head shining, front impressed with a short longitudinal groove; antennæ moderately robust, sub-filiform, half the length of the body. Thorax rather broader than long, sub-cylindrical, sides deeply constricted behind the middle; above smooth and shining, deeply impressed behind the middle with a transverse groove, which terminates on either side in the lateral constriction. Scutellum shining black. Elytra much broader than the thorax, sub-quadrate-ovate, very convex, each elytron with ten rows of fine fuscous punctured striæ, sub-sulcate towards the apex, outer stria sulcate for its whole length; interstices slightly convex towards their apex, outer margin of elytron slightly thickened. Beneath shining fulvous, legs, base of pro- together with the whole of the metathorax shining black; hinder thighs slightly thickened.

Hab. Venezuela.

My own collection.

Nearly allied to *Lema rufa*.

Lema Fortunei.

Elongata, convexa, rufa, nitida; tibiis, tarsis antennisque (harum articulo basali excepto) nigris; elytris tenuiter punctato-striatis, cyaneis.

Long. $3\frac{1}{2}$ lin.

Elongate, convex, shining rufous; antennæ (the basal joint excepted), tibiæ and tarsi black; elytra shining metallic blue. Head much constricted behind the eyes, front with a deep oblique groove on either side; space between impressed with an oblong fovea; antennæ filiform, moderately robust, rather more than half the length of the body, black, opaque, covered with adpressed hairs, basal joint rufous, glabrous, third joint obconic, nearly twice the length of the second. Thorax sub-cylindrical, scarcely longer than broad, rather wider behind, sides deeply constricted

at their middle; above smooth and shining, impunctate, with the exception of a few fine impressions, which are placed in two or three somewhat irregular rows down the centre of the disc; just in front of the basal margin is a single distinct fovea. Scutellum transverse-quadrate, obscure rufous. Elytra oblong-elongate, convex, distinctly impressed transversely below their base; each elytron with ten regular rows of fine punctures, which become still finer towards their apex, the outer row sulcate. Beneath rufous, sparingly covered with very short pubescence; middle of abdomen stained with piceous; tibiæ and tarsi, the extreme apex of the latter excepted, black; posterior pair of thighs much shorter than the abdomen.

Hab. Northern China. Collected by Mr. Fortune.

Lema oculata.

Elongata, convexa, pallide fulva, nitida; capite (basi extremâ exceptâ), antennarum articulis intermediis, pectore elytrorumque lineâ brevi annuloque apicali, nigris; tibiis tarsisque nigro-piceis.

Long. 4 lin.

Elongate, convex, pale shining fulvous; head, intermediate joints of antennæ, the breast, a short line near the middle of the outer margin, and an annulus at the apex of each elytron, black; tibiæ and tarsi piceous. Head constricted behind the eyes, front obliquely grooved on either side; face sub-elongate; shining black, base of neck fulvous; antennæ slender, filiform, nearly equal in length to the body, second and third joints, together with the first and fourth beneath, shining fulvous, fifth and three following black, three apical joints yellowish-white. Thorax sub-cylindrical, rather longer than broad; sides deeply constricted at their middle, above smooth and shining, impressed here and there on the sides with a few fine punctures; behind the middle is a shallow transverse groove, terminating at either end in the lateral constriction. Scutellum smooth, shining black. Elytra oblong, convex, obsoletely depressed transversely below their base, each elytron with ten regular rows of fine punctures; shining fulvous, a short longitudinal line just within the middle of outer margin, the suture from immediately before its middle, and a large patch covering the posterior third of each elytron and enclosing a circular fulvous spot, black. Beneath shining fulvous, covered with short adpressed hairs; breast black, tibiæ and tarsi piceous.

Hab. Ecuador.

Lema Hebe.

Sub-elongata, convexa, piceo-nigra, nitida; antennarum apice, scutello, elytrorum basi, meso- et metathorace, tibiarum apice femoribusque fulvis.

Long. $2\frac{1}{2}$ lin.

Sub-elongate, convex, shining pitchy black; the extreme apex of antennæ, scutellum, base of the elytra, meso-and metathorax, thighs, together with the base of the tibiæ, fulvous. Antennæ filiform, equal in length to the body, their two terminal joints fulvous. Thorax rather broader than long, sub-cylindrical, strangulated behind the middle; surface smooth and shining, obsoletely punctured. Scutellum shining fulvous. Elytra oblong, convex, deeply impressed transversely below their base; each elytron with ten rows of fine punctures, which become nearly obsolete towards the apex, puncturing on the transverse depression coarse and deeply impressed; shining black, the basal third bright fulvous. Beneath nigro-piceous, meso- and metathorax, thighs and base of tibiæ fulvous; hinder pair of thighs incrassate, shorter than the abdomen.

Hab. Dory, New Guinea.

Collections of A. R. Wallace and W. W. Saunders, Esqs., and J. S. Baly.

Genus Crioceris, Geoff.

Crioceris Adonis.

Convexa, nitido-cærulea, antennis nigris; elytris thorace multo latioribus, utrisque plagâ magnâ, a basi ad paullo infra medium extensâ, introrsum valde emarginatâ, flavâ.

Long. 5 lin.

Convex, deep shining metallic blue, each elytron with a large sub-reniform patch, extending from the base to beyond the middle, bright yellow. Head deeply constricted behind the eyes, forehead with a deep fovea; antennæ black, moderately robust, nearly equal to the body in length, sub-filiform. Thorax as broad as long, sub-cylindrical, sides constricted in the middle; above smooth and shining, sides indistinctly and irregularly excavated, surface minutely and remotely punctured, the puncturing rather more distinct towards the front, on the middle of the disc are several irregular longitudinal rows of punctures; in front of the base is a shallow fovea. Scutellum trigonate. Elytra very much broader than the thorax, four times its length, convex, indistinctly

impressed transversely on the suture below the base; surface smooth and shining, each elytron with eleven regular rows of punctures (the first abbreviated), puncturing rather finer towards the apex; interstices each with a row of finer impressions, placed nearly equidistant between the striæ; deep shining blue; on each elytron is a large bright yellow patch, which extends longitudinally from the base to beyond the middle, and transversely from the outer margin nearly to the suture, its inner edge being deeply emarginate. Beneath dark shining blue; legs moderately robust, thighs slightly thickened, the hinder pair shorter than the abdomen; this latter with a double row of patches of adpressed white hairs.

Hab. Northern India.

Crioceris flavipennis.

Oblongo-elongata, convexa, nitido-cyanea; antennis gracilibus, longitudine corporis vix brevioribus; thorace sub-quadrato, lateribus medio valde constricto; elytris thorace multo latioribus, oblongis, tenuiter irregulariter seriatim punctatis, flavis.

Long. 6½ lin.

Oblong-elongate, convex, shining metallic blue; elytra pale-yellow. Head smooth, constricted behind the eyes, posterior portion of neck obliquely strigose; face elongate, front impressed in the centre with a deep oblong fovea; antennæ slender, filiform, nearly equal in length to the body, third and fourth joints nearly equal. Thorax slightly broader than long, sub-cylindrical, deeply constricted at the middle of the sides; above smooth and shining, obliquely impressed on either side near the base, posterior half of disc longitudinally grooved. Scutellum sub-triangular, smooth and shining. Elytra much broader than the thorax, oblong, convex above; pale shining yellow, their surface minutely punctured, puncturing irregularly arranged in striæ on the disc, confused near the outer border. Legs slender, elongate.

Hab. Northern India.

Crioceris Bakewellii.

Oblonga, convexa, rufo-fulva, nitida; antennis (articulo basali excepto), tibiis, tarsis, elytrorumque plagâ magnâ communi, nigris.

Long. 3½ lin.

Oblong, convex, shining rufo-fulvous; antennæ (their basal

joints excepted), tibiæ, tarsi and a large common patch on the posterior half of the elytra, black. Head constricted behind the eyes; face elongate; antennæ moderately robust, sub-filiform, half the length of the body, black, basal joints rufo-fulvous, third joint more than half the length of the second; eyes also black. Thorax sub-cylindrical, rather longer than broad; sides deeply constricted at their middle; above shining, impunctate. Scutellum smooth. Elytra broadly oblong, much broader than the thorax; convex, indistinctly depressed below the scutellum, sides excavated immediately beneath the shoulders; surface very smooth and shining, basal half of inner disc punctate-striate; rest of the surface, with the exception of a single row of minute punctures running parallel to the suture, impunctate; bright rufo-fulvous, a large common rotundate patch, extending from just before the middle nearly to the apex, black. Beneath shining rufo-fulvous, tibiæ and tarsi black, the former clothed towards their apex with bright fulvous hairs.

Hab. Moreton Bay. Collected by Mr. Diggles.

Crioceris pulchella.

Elongata, convexa, læte cærulea, nitida; elytris punctato-striatis, rufo-fulvis.

Long. 4¾ lin.

Elongate, convex, deep shining metallic blue; elytra rufo-fulvous. Head deeply constricted behind the eyes; face sub-trigonate; forehead longitudinally grooved; antennæ more than two-thirds the length of the body, filiform, moderately robust, third joint scarcely longer than the fourth. Thorax sub-quadrate, sub-cylindrical, sides deeply constricted at their middle, armed near their apex with an obtuse tubercle; above smooth, impunctate, apex narrowly margined; immediately behind the middle is a deep transverse groove, which terminates at either end in the lateral constriction; on each side in front is a short transverse impression. Scutellum sub-trigonate, its apex obtuse. Elytra much broader than the thorax, more than four times its length, convex, slightly sinuate on the sides below the shoulders, each elytron with eleven rows of distinct punctures, the first abbreviated. Body beneath clothed with adpressed yellowish-white hairs; legs sub-elongate; thighs slightly thickened.

Hab. Northern India.

Family MEGALOPIDÆ.

Genus Agathomerus, Lac.

Agathomerus Sallei.

Sub-elongata, fulva, sparsim concolori-pubescens; antennis, verticis maculâ, alterâ thoracis disci, plagâ magnâ utroque elytro, maculis pleurarum tarsisque posticis, nigris.

Long. 3—3½ lin.

Sub-elongate, fulvous, sub-nitidous, sparingly clothed with coarse hairs, body beneath more densely pubescent; antennæ (their basal joint sometimes excepted), an obscure spot on the vertex, an oblong one on the disc of the thorax in front, a large patch nearly covering the disc on either elytron, some shining spots on the pleuræ, together with the hinder pair of tarsi, black. Head finely punctured on the front; face transversely grooved at the base of the clypeus; eyes and apex of jaws piceous, basal joints of antennæ sometimes bright fulvous. Thorax one-half broader than long at the base; sides notched at their extreme base and apex, slightly rounded, narrowing gradually towards the front; above convex, narrowly margined at the base and apex; surface glabrous, smooth and shining, minutely and remotely punctured. Scutellum triangular. Elytra broader than the thorax; sides parallel; apex sub-acutely rounded, dehiscent at the suture; above convex, slightly flattened along the suture; shoulders slightly prominent, obtuse, surface coarsely and deeply punctured, sparingly clothed with fulvous hairs. Beneath fulvous, more densely covered with concolorous pubescence, three spots on either side (one on the prothorax, the two others on the front and side of the pleura) shining black; posterior tarsi pitchy black, hinder pair of thighs slightly thickened, ovate.

Hab. Mexico.

Collected by M. Sallé.

Family CHRYSOMELIDÆ.

Genus Doryphora, Illig.

*Doryphora cruciata,** Stäl, Öfvers. af Köngl. Vetens. Akad. Förh. 1857, p. 57 (1858).

Rotundato-ovata, valde convexa, picea, antennis pedibusque rufo-fuscis, thoracis lateribus et apice elytrisque flavis, his utrisque limbo anguste, fasciâ transversâ vix pone medium vittulisque, piceis.

Long. 5 lin.

* See note at p. 161.

Rotundate-ovate, convex, piceous. Head finely punctured, antennæ, labrum and palpi rufo-fuscous. Thorax nearly three times as broad as long; sides rounded, narrowed in front, anterior angles submucronate; above finely and remotely punctured, punctures on either side the disc more crowded and rather more deeply impressed, lateral margin impunctate; the anterior edge and a broad space on the lateral border bright yellow, slightly stained with piceous. Elytra rather broader than the thorax, convex, each elytron with ten punctured striæ, the first abbreviated, the striæ severally composed of a double row of punctures; yellow, the suture, the extreme outer limb and a transverse band behind the middle, piceous; on each elytron in front are four short piceous vittæ, each vittæ being formed of two longitudinal lines, confluent at their base, the space between being more or less stained with pale piceous; behind the middle are also three others, formed in a similar manner, the two nearest the suture united at their apex; near the apex is a short oblique piceous line, confluent with the suture. Body beneath piceous, legs rufo-fuscous, thighs more or less stained with piceous.

Hab. Brazil.

Doryphora De Gandei.

Ovata, valde convexa, subtus viridi-chalybeata, supra nitido-cuprea; elytris tenuiter punctato-striatis, striis ad latera confusis, interstitiis distincte punctatis.

Long. $4\frac{2}{3}$ lin.

Ovate, convex, viridi-chalybeate beneath, above shining cupreous. Head finely punctured, labrum fulvous; antennæ half the length of the body, bluish-black, two basal joints fulvous beneath. Thorax more than twice broader than long; sides straight, narrowed and rounded in front, anterior angles obsoletely mucronate; above sub-remotely and finely punctured, puncturing rather deeper on the sides and base. Elytra broader than the thorax, very convex, rotundate-ovate, surface very finely reticulate-aciculate, finely and sub-remotely punctured, each elytron impressed on its inner half with five or six regular rows of somewhat deeper punctures.

Hab. Peru.

Genus Leptinotarsa, Chev. MSS.

Leptinotarsa porosa.

Ovata, convexa, nitido-ænea, elytris punctis magnis fortiter

impressis, punctis fundo cupreis, prope suturam seriatim—ad latera confuse—dispositis.

Long. 4¾ lin.

Ovate, convex, metallic green, with a more or less distinct coppery tint above. Head finely punctured, forehead angularly impressed; antennæ black, basal joints dark æneous. Thorax twice broader than long; sides straight and nearly parallel, rounded and narrowed in front; surface coarsely and deeply punctured, punctures irregularly confluent. Elytra rather broader than the thorax, convex, surface impressed with numerous large deeply excavated punctures, more or less cupreous at their extreme base, somewhat distantly arranged in rows near the suture, irregularly placed towards the sides; interstices slightly swollen, more especially towards the lateral border, smooth and shining, here and there impressed with a few fine punctures. Four anterior tarsi with their basal joint dilated in the *male*.

Hab. Brazil.

Genus Paralina, Baly.

Antennæ filiformes, articulo primo incrassato, secundo parvo, tertio elongato, cæteris leniter compressis.

Labrum transversum.

Mandibulæ subtrigonæ, apice bidentatæ.

Palpi maxillares clavati, articulo ultimo truncato: *labiales* parvi, articulo ultimo obtuso.

Mentum transversum.

Caput sub-declive, breviter triangulare, *oculis* anguste oblongis.

Thorax transversus, lateribus fere rectis.

Scutellum semiovatum.

Elytra ovata, postice leniter ampliata, convexa.

Pedes sub-elongati, *tarsis* simplicibus.

Prosternum longitudinaliter elevatum.

Mesosternum parvum, perpendiculare, metasterno ocultatum.

Metasternum antrorsum inter coxas intermedias ad prosterni basin protensum.

Corpus oblongum, convexum.

Type—*Chrysomela Indica*, Hope, Zool. Mis. 29, from Nepaul; also described under the names of

Chrysomela Caschmierensis, Redtenb. in Hugel, Kaschen. iv. 558.

Lina clata, Stäl, Öfvers. af Köngl. Veten. Akad. Förh. 1857, p. 60 (1858).

This genus is at once separated from its allies by the peculiar form of the metasternum, the apex of which articulates with the base of the prosternum.

Genus Gonioctena, Redtenb.

Gonioctena flexuosa.

Elongata, sub-depressa, nigra, nitida; elytris punctato-striatis, flavis, utrisque fasciâ latâ flexuosâ ante medium maculâque ante apicem nigris.

Long. 3 lin.

Elongate, sub-depressed, shining black; elytra pale yellow, each with a broad flexuous band before the middle and a large sub-apical spot shining black. Head coarsely punctured, excavated between the eyes; face sub-horizontal; antennæ scarcely longer than the head and thorax, basal joints pale fulvous beneath. Thorax more than twice broader than long, deeply excavated in front; sides rounded, narrowed in front, nearly straight near the base, their outer border thickened; above sub-convex, smooth and shining, sub-remotely punctured, sides slightly excavated, coarsely and more closely punctured. Scutellum broadly semi-ovate, shining black. Elytra scarcely broader than the thorax; above sub-convex, smooth and shining, each elytron with ten rows of punctures, the first abbreviated, the outer one placed on the extreme outer border; interstices slightly convex; pale yellow, a broad sinuous band placed before the middle, and sending a broad process a short distance down the suture, and a large sub-ovate patch behind, shining black. Beneath shining black, abdominal segments narrowly edged with piceous; four posterior tibiæ armed on their outer edge at the apex with a short acute spine.

Hab. Northern China. Collected by Mr. Fortune.

British Museum, and my own collection.

Genus Australica.

Sub-genus Augomela, Baly.

Augomela ornata.

Ovata, convexa, nitidissima, subtus obscure ænea, supra cupreo-aurea, æneo-micans; tibiis, tarsis, vertice, thoracis basi apiceque et elytrorum utrumque suturâ, margine laterali plagâque magnâ cruciformi, nitido-purpureis.

Long. 3½ lin.

Ovate, convex, beneath dark, shining green, above golden-copper,

with a brassy-green reflexion; vertex, the base and apex of the thorax, the suture, outer margin and a large cruciform patch on each elytron, shining purple; all the purple markings are narrowly bordered with metallic green, and also have a green reflexion in certain lights. Head shining, clypeus distinctly punctured; antennæ black, their basal joints fulvous. Thorax more than twice broader than long; sides rounded, narrowed from their base to the apex; above convex, smooth and shining, minutely punctured, sides and apex impressed here and there with deep punctures. Scutellum smooth, purplish-copper. Elytra scarcely broader than the thorax, above convex, sides transversely impressed below the shoulder; each elytron with eleven rows of punctures, the first abbreviated, interstices minutely punctured; golden-copper, the suture, the outer margin and a large cruciform patch placed on the disc of each elytron, and extending from the base nearly to the apex, bright purple. Beneath dark metallic-green, with a coppery reflexion; tibiæ and tarsi purple.

Hab. Moreton Bay.

Augomela dives.

Late ovata, convexa, auro-ænea, nitidissima, lineâ verticali, thoracis limbo angusto, basi dilatato, elytrorumque suturâ, margine laterali, lineâ transversâ ante medium utrimque abbreviatâ vittâque posticâ disco exteriori positâ, nitido-cæruleis, subtus nitido-purpurea, abdomine pedibusque auro-maculatis.

Long. 3 lin.

Broadly ovate, convex, bright golden-green; a longitudinal line on the vertex, the narrow limb of the thorax, dilated at the basal margin, the extreme outer border of the elytra, the suture, a transverse line in front and a short vitta behind, near the outer margin, bright metallic-blue; these markings, like those in the last species, are all more or less bordered with metallic-green. Head smooth, face separated from the clypeus by a deep transverse groove, front with a longitudinal grooved line, which runs downwards to the middle of the transverse groove; antennæ bluish-black, basal joint, also the under surface of the two or three following joints, fulvous. Thorax more than twice broader than long; sides rounded, narrowed in front, nearly straight behind; surface very faintly and minutely punctured; remotely scattered here and there are some deep but fine punctures. Scutellum

purple. Elytra convex, smooth and shining; sides transversely impressed below the shoulder; each elytron with eleven regular rows of punctures, the first abbreviated; the suture, the extreme outer border, a transverse band in front, commencing at the outer extremity of the transverse depression and extending inwards as far as the third stria from the suture, and a short vitta behind the middle, placed on the outer disc, bright metallic-blue. Beneath bright purple, legs and abdomen marked with coppery-gold.

Hab. New Guinea.

Of this beautiful species, which has not been taken by Mr. Wallace during his recent expedition to New Guinea, I know but two specimens, one in the British Museum, the other in my own Collection.

Family CASSIDIDÆ.

Genus Hoplionota, Hope.

Hoplionota Templetoni.

Sub-rotundata, leniter convexa, subnitido-fulva, elytris utrisque antice bi-, postice laxe subreticulo-carinatis; maculis duabus nigris, unâ basi, alterâ pone medium, positis.

Long. 3 lin.

Sub-rotundate, slightly convex, fulvous, each elytron with two large spots, one at the base, the other just behind the middle, black; tarsi fuscous. Head with two longitudinal grooves on the front; eyes pitchy black; antennæ equal in length to the thorax, their apex obscure fuscous. Thorax more than twice longer than broad, deeply rotundate-emarginate in front, sides dilated, their outer margin rounded; above convex, smooth and shining, covered here and there with irregular excavations, dilated margin horizontal, covered with large deep punctures. Elytra scarcely broader than the thorax, humeral angles slightly produced anteriorly, their apex obtuse; sides moderately, apex regularly rounded; above sub-convex, sides sub-sinuate below the shoulders; surface deeply punctate-striate; each elytron with two elevated longitudinal costæ: the first, near the suture, sinuate and extending from the base to the apex, just beyond its middle sending off a transverse branch to the outer border; the second, commencing at the shoulder, runs nearly parallel to the first, but terminates at its transverse branch; this latter, soon after its commencement, gives off an irregular branch posteriorly, which causes the hinder portion of

the surface to appear loosely reticulate; outer border dilated, slightly deflexed, its surface covered with several rows of deep punctures, their interstices transversely elevated; each elytron with two large black spots, the first placed at the base, the other below the middle. Tarsi fuscous.

Hab. Ceylon.

A single specimen in my own collection.

Genus Calliaspis, Boh.

Calliaspis Bohemani.

Ovata, sub-convexa, pallide fulva, supra nitido-nigra, anguste fulvo-limbata, antennis flavo-albis, apice nigris.

Long 2—2¼ lin.

Ovate, sub-convex, pale fulvous beneath, shining black above, narrowly edged with fulvous; antennæ yellowish-white, three terminal joints (the apex of the last of these excepted) black. Head smooth; antennæ longer than the head and thorax. Thorax twice as broad as long at the base, deeply concave-emarginate in front, sides dilated, regularly rounded, narrowed from their base to the apex; above convex, slightly concave near the sides; surface smooth and shining, finely and remotely punctured, puncturing at the sides rather coarser and more crowded; on either side the centre of the disc is a single shallow fovea; the extreme lateral and apical margins narrowly edged with fulvous. Scutellum smooth, impunctate. Elytra not wider than the thorax at the base, rather broader across their middle; humeral angles sub-acute, sides rounded and dilated to their middle, thence regularly rounded to the apex; above sub-convex, sides deeply depressed transversely below the shoulders; each elytron with eleven rows of fine punctures, the first abbreviated; dilated border deflexed, smooth, impunctate; extreme lateral margin fulvous. Beneath pale fulvous.

Hab. Peru, Upper Amazons.

Genus Porphyraspis, Hope.

Porphyraspis pulchella.

Subquadrato-rotundata, convexa, nitido-rufa; thoracis lateribus elytrisque purpureis, his plagâ magnâ anticâ rufâ.

Long. 2¾ lin.

Subquadrate-rotundate, convex, shining rufous; sides of

thorax and elytra bright metallic purple; these latter with a large common patch in front, extending from their base to beyond the middle, rufous. Head smooth, two basal joints of antennæ rufous (the rest wanting). Thorax concave-emarginate in front; sides obliquely produced, notched close to the anterior angles; above convex on the disc, smooth and shining, impunctate, impressed on either side at the base, sides deeply and irregularly punctured, bright metallic purple. Elytra broader than the thorax, anterior angles produced obliquely forwards, their apex obtuse; sides rounded, apex obtusely rounded; above convex, hollowed on the sides below the shoulder; deeply punctate-striate, the suture and three following interstices in front, together with the six nearest interstices to the suture behind, longitudinally costate, rest of the surface transversely costate; the second interstice from the sutural one sub-carinate, and sending just before its middle a branch to the suture; lateral margin moderately dilated, its outer edge slightly recurved; its surface impressed with a double row of punctures, their interstices transversely elevated.

Hab. Columbia?

A single specimen in my own collection.

Genus Dolichotoma, Hope.

Dolichotoma gloriosa.

Sub-rotundata, dorso valde gibbosa, obscure ænea, sub-opaca; elytris sanguineis, limbo, suturâ plagâque magnâ transverso-quadratâ baseos obscure æneis.

Long. 9½ lin.

Sub-rotundate, obscure æneous, sub-opaque. Head longitudinally grooved down the front; antennæ nearly two-thirds the length of the body, black, six basal joints shining, the remainder opaque, two basal joints stained with rufous beneath. Thorax twice broader than long, concavely excavated in front; sides obliquely rounded, nearly straight at their extreme base; above longitudinally convex in the middle, sides concave, lateral margin reflexed; on either side the disc are several distinct punctures; centre of the disc impressed with an indistinct longitudinal groove, at the base of which, immediately in front of the basal lobe, is a transverse groove; sides obsoletely excavated, whole surface minutely and remotely punctured, sparingly covered here and there with very fine adpressed hairs. Elytra broader than the thorax,

humeral angles obtuse; sides rounded and slightly dilated to their middle, thence narrowed and rounded to the apex, the latter regularly rounded; above convex, elevated before the middle into a stout pyramidal gibbosity, obsoletely excavated near the base; surface impressed with numerous large shallow punctures arranged in striæ; these become indistinct and nearly obsolete towards the apex; lateral margin separated from the disc by a single row of deep transverse impressions, dilated horizontally; deeply sinuous before the middle, its outer border reflexed, surface smooth, impunctate; bright sanguineous, limb, suture and a large transverse quadrate common patch in front, extending from the base as far as the hinder surface of the dorsal gibbosity, obscure æneous, dilated border in front also marked with several obscure æneous spots. Beneath dark shining æneous, anterior thighs and tibiæ stained with rufous.

Hab. Ega, Upper Amazons.

Note on *Doryphora cruciata*.

Since the description of this species has been in type I have discovered that H. Stäl has described a pale variety under the name of *D. cruciata*; I have therefore been obliged to withdraw the name *Euphrosyne*, proposed by myself for the insect, and to substitute that given by H. Stäl.

X. *Notes on the British Species of* Heterocerus. By Geo. R. Waterhouse, Esq., F.Z.S.

[Read Feb. 7th, 1859.]

The following Notes are communicated to the Society with the view of drawing attention to a group which appears to have been much neglected. In the latest published list of the British species only three are enumerated,* whilst in the "*Naturgeschichte der Insecten Deutschlands*," by Erichson, no less than twelve species are described as inhabiting Germany; several of these (besides the species here enumerated) have a wide range, and will therefore probably, in part at least, be found in England. In pointing out that there are six well-defined English species, besides one which is doubtful, the writer cannot but feel that his list is far from perfect, since the whole of these exist in his own Collection, and he cannot lay claim to any diligence in collecting material for the study of the group.

Are the males of the species of *Heterocerus* usually very scarce? The author has found such to be the case with regard to his own and some other specimens submitted to him for examination. Out of about fifty specimens of *Het. lævigatus*, he only found one individual presenting the male character; in *H. obsoletus* he finds about one male to ten females; in the *H. fossor*, of this list, he finds no male among the ten specimens which he has examined, and the same remark applies to the *H. flexuosus*, of which he possesses upwards of twenty specimens. Possibly the so-called male characters only become evident in well-developed individuals.

Heterocerus lævigatus, Panzer, Faun. Ins. Germ. xxiii. 13 (1796—1809).

———— ————, Steph. Illustr. ii. 101, 4 (1829); Manual, p. 80, 621 (1839).

———— ————, Kiesenw. Germ. Zeitschr. iv. 217, 15, pl. 3, fig. 10.

* Others have no doubt been enumerated, but, as their distinctive characters have never been clearly pointed out, they have not been recognized.

Heterocerus lævigatus, Erichs. Ins. Deutschl. iii. 548, 8.
——————— *Marshami*, Steph. Illustr. ii. 101, 3; Man. 80, 620 *a*.
——————— *pusillus*, Waltl. Isis, 1839, 221, 23.

As this is the commonest London species, and has the pale markings very complete, I shall describe the insect in some detail, and compare the other British species with it. Oblong, black, densely clothed with a fine ash-coloured pubescence, almost without any admixture of long hairs excepting on the sides of the thorax, where they are pretty plentiful; jaws pitchy, or often ferruginous. Thorax transverse, rather narrower than the elytra; contracted in front; the sides moderately rounded; the hinder margin obliquely truncated on either side; the posterior angles obtuse, and very narrowly margined—that is to say, they have a delicately impressed line immediately within the outer margin, and which follows the outline of the thorax; this may be traced along the whole of the posterior margin, and at the posterior angles, but extends very little way up the sides.* Elytra nearly four times the length of the thorax, with the humeral angle somewhat rounded, and more prominent than the broadest part of the thorax; the sides at first straight and parallel, but at a short distance below the shoulder they are slightly dilated and rounded; the apex is obtusely rounded. Anterior tibiæ dilated, rounded externally at the apex; the outer margin denticulate, and furnished with spines; these are usually about seven in number on the outer side of the tibiæ, and three at the apex; the longest are near the apex, and their length is very nearly equal to the width of the tibia at the same part; sometimes eleven of these spines may be counted. With regard to the colouring, there are two varieties, one in which the markings are very pale testaceous, the sides of the thorax pale testaceous, but interrupted in the middle, and the sides of the abdomen and the legs likewise pale. Specimens presenting these conditions are common in collections, and are perhaps somewhat immature. In others the markings are rufo-testaceous, the sides of the thorax almost immaculate as well as those of the abdomen, and the legs are more or less pitchy, especially the tibiæ.

[In the common type of the markings on the elytra, the *Heteroceri* have a post-humeral band, which, entering the elytra form the outer margin, run inwards a short distance, and then is suddenly recurved, and running upwards encloses a small dark area

* This impressed line is seen in all the *Heteroceri* here noticed, excepting "*H. fossor*?" and *H. flexuosus*.

at the humerus: a second band springs from the side of the elytra in the same manner, but considerably below the middle, and is recurved so as to join what I will call the second discoidal spot, and which is placed but little below the middle of the elytron; the first discoidal spot being placed between this and the base of the elytra; besides these, there is a spot *at* the base of the elytron near the scutellum, and another which, from its position, may be termed the sub-apical spot. Moreover, the outer margin of the elytron is also frequently pale.]

In *H. lævigatus* the margin of the elytra is entirely pale; the two bands run inwards but a short distance from the margin, and then are abruptly truncated; the sub-humeral band descends lower than usual, and hence is separated by a narrow space only from the second band; its inner ascending branch is commonly (but not always) isolated. The basal spot sends down a branch to join the first discoidal spot; the second discoidal is free, and divided longitudinally by a dark line, as is also the sub-apical spot.

[The mandibles in the *Heteroceri* are obliquely cleft, or notched, on the outer margin, about midway between the base and apex of the jaw, and a salient point is thus produced at that part. Now in the males the margin between the notch and the base of the tooth is frequently recurved, and produced into a vertical lobe.]

In *H. marginatus*, ♂, the lobe referred to is small and pointed; the clypeus is provided in front with two minute acutely-pointed processes, and these are rather widely separated; and the thorax is as broad as the elytra.

Four, out of five specimens which stand as *H. lævigatus* in Stephens' Collection, belong to the present species; the fifth specimen is *H. marginatus*.

The *H. Marshami*, of Stephens, is represented in the same Collection by two specimens, both of which belong to the *H. lævigatus*.

Common on the muddy margins of ponds and ditches in the neighbourhood of London, and I believe widely distributed in England.

Heterocerus obsoletus, Curtis, British Entom. v. 224.
——— ———, Steph. Illustr. ii. 102, 5; Man. 80, 622.
——— ———, Kiesenw. Germ. Zeitschr. iv. 215, 14, pl. 3, fig. 9.
——— ———, Erichs. Ins. Deutschl. iii. 545, 4.
——— *marginatus*, Marsh. Ent. Brit. p. 400, 1.

Much larger than *H. lævigatus* (being usually 2½ lines in length), relatively broader, and more depressed; the colouring (including that of the legs and the pubescence) darker. The markings usually are by no means distinct, and are broken up into small spots. The basal spot on the elytra is generally wanting, and seldom distinct; the discoidal and sub-apical spots are divided; the bands do not exist as such, being only represented by spots on the sides of the elytra, which have the margins dark. The thorax is scarcely as broad as the elytra, contracted in front, has the posterior angles rounded and margined, and is commonly concolorous, but sometimes has a small rufescent spot at the anterior angle. In the male the thorax is as broad as the elytra, and but little contracted in front; the jaws are rather more prominent, and they have the outer margin recurved and produced anteriorily into a triangular tooth-like process: the clypeus is simple.

Common on the borders of the ditches of salt or brackish water, at Sheppy.

Heterocerus marginatus, Fab. Ent. Syst. i. 262.
——— ———, Panzer, Faun. Germ. xxiii. 12.
——— ———, Steph. Illustr. ii. 100, 1; Man. 80, 619.
——— ———, Kiesenw. Germ. Zeitschr. iv. 208, 5, pl. 3, fig. 5.
——— ———, Erichs. Ins. Deutschl. iii. 546, 5.

The size and proportions of this species is much like *H. lævigatus*, but the posterior angles of the thorax are less obtuse, and, indeed, are very nearly right angles, and they are more distinctly margined. The markings on the elytra also furnish distinctions: the basal spot is wanting; the humeral band does not run so far back before it is recurved, and the ascending inner branch is not disunited. The post-median band runs upwards internally to unite with the second discoidal spot; the discoidal spots are simple; the margin of the elytra is narrowly edged with testaceous, but interrupted between the pale bands.

Found on the margins of ponds and ditches in the neighbourhood of London. My specimens are chiefly from Richmond Park.

Eight, out of ten specimens which stand under the name *H. marginatus* in Stephens' Collection, belong to the present species; one of the other specimens is *H. flexuosus*, and the other is *H. lævigatus*.

Heterocerus fusculus, Kiesenw. Germ. Zeitschr. iv. 220, 17, pl. 3, fig. 11.

———— ————, Erichs. Ins. Deutschl. iii. 549, 9.

Extremely like *H. lævigatus*, but much smaller; the thorax relatively rather larger, the punctuation rather stronger; the colouring (including that of the pubescence) darker; the legs and antennæ pitchy. The thorax is often rufescent at the anterior angles; the markings on the elytra like those of *H. lævigatus*.

Length 1½ lin.

My specimens, and some others which I have seen, are from the Fens of Whittlesea.

I am inclined to believe this may be a diminutive race of *H. lævigatus*.

Heterocerus sericans, Kiesenw. Germ. Zeitschr. iv. 212, 9 (1843).

———— ————, Erichs. Ins. Deutschl. iii. 550, 11.

———— ————, Wollast. Zoologist, 1852, p. 3622.

———— *pusillus*,* Steph. Illustr. v. 395 (1832); Man. 81, 623 (1839).

———— *minutus*, (Dej.) Dawson and Clark, Catal. of Brit. Col. p. 11.

A minute species (1½ line in length), relatively much narrower than *H. lævigatus*, more linear, and with the thorax larger. The thorax is rather broader than the elytra, and has the sides boldly rounded in the female, and in the male is distinctly broader. The general colour of the insect is pitchy black; the sides of the thorax, and frequently a middle longitudinal mark, rufescent. The markings on the elytra are also rufescent, rather broad, and not well defined; they consist of a patch at the shoulder, an oblong discoidal patch on the basal third of the elytron, a transverse band below the shoulder; a curved band, with the convex side forwards, below the middle of the elytra, and a sub-apical spot; the outer margin of the elytron is also pale, but interrupted immediately behind the pale colouring at the shoulder. The pubescence with which the insect is clothed is short and ash-coloured.

Represented by eight specimens in Mr. Stephens' Collection; they were received from the Rev. F. W. Hope, who discovered the insect in North Wales; my own specimens are also, some of

* The name *pusillus* was previously applied to a North American species of *Heterocerus* by Say. See Journal of the Acad. of Nat. Sci. of Philadelphia, vol. iii. p. 200 (1823).

them, from the same quarter, having been given me by Mr. Hope. I have also received specimens from North Wales, collected by Charles Darwin, Esq., and am indebted to Mr. Wollaston for a specimen which is labelled as coming from "Ferriby."

I may here remark, that there is a nearly allied species (*H. hispidulus*, Kiesenwetter), which, having a wide range on the Continent, is not unlikely to be found in England. It is a trifle larger than *H. sericans*, and may be readily distinguished by the short (almost scale-like), pale, glistening setæ, which, combined with a fine pubescence, covered the upper surface of the body.

Heterocerus flexuosus, Steph. Illustr. ii. 101, 2; Man. 80, 620.
———— *femoralis*, Kiesenw. Germ. Zeitschr. iv. 206, 3, pl. 3, f. 4.
———— ————, Erichs. Ins. Deutschl. iii. 544, 3.
———— ————, Wollaston, in Zoologist, 1852, p. 3622?

This species is usually rather larger than *lævigatus;* rather more elongate; has the thorax broader, more rounded at the sides, and *not margined* at the posterior angles; sometimes both the anterior and posterior angles of the thorax have a rufo-testaceous spot, but very frequently the spots are wanting. The elytra more nearly resemble those of *H. marginatus* in their markings, inasmuch as the discoidal spots are not divided, and the fasciæ are frequently complete, the post-medial fascia joining the second discoidal spot, and the sub-humeral band being (often) recurved and enclosing an oblong dark area at the shoulder; the sub-apical spot often sends down a small branch to join the pale colour which margins the apex of the elytra; the side of the elytron is also pale, but more or less interrupted. There is this important difference, however, between the markings of the present species, and those of *H. marginatus*, namely, the *H. flexuosus* has a basal spot; and, indeed, there is often a transverse band at the base. The ash-coloured pubescence with which the insect is clothed is distinctly longer than in other species here noticed.

I have reason to believe this is a common insect on our coasts. I have taken it at Felixstow in Suffolk, and at Southend. Mr. Squire found it at Deal. A specimen in Mr. Stephens' Collection (which is believed to come from Mr. Haliday) is labelled "*H. sabulosus*, n. sp., Irish Channel sandy coasts." The *H. flexuosus* seems to have been founded by Stephens upon a single specimen, which presents a variation in the markings which is by no means uncommon. The bands and spots on the elytra have run, or

enlarged in such a manner that the pale colour prevails. Its locality is given as "the banks of the Thames, beyond Gravesend." Dr. Power has a fine series of specimens from the same place, including varieties resembling Mr. Stephens' specimen.

Heterocerus rectus, Waterh.

——— *fossor*, Kiesenwetter, Germ. Zeitschr. iv. 204, 2, pl. 3, f. 3?

H. oblongus, parallelus, niger, pube pallida cinerea vestitus; thoracis angulis posterioribus immarginatis; elytris angustis; fasciis maculis, basique rufo-testaceis; pedibus piceis.

Long. $2\frac{1}{3}$ lin.

This species agrees with *H. flexuosus* in not having the thorax margined at the posterior angles; the markings on the elytra, moreover, are essentially the same, excepting that the first discoidal spot is rather more remote from the post-median band; and the bulk of the insect is about the same, but the form is different, being narrower, and more parallel; both thorax and elytra are relatively longer; the head is narrower; the spines of the anterior tibiæ are rather stouter and shorter, and the pubescence is shorter. The thorax is rather broader than the elytra, has the sides gently rounded, and is somewhat contracted in front; the hinder part is obliquely truncated on either side, and the posterior angles are obtuse. (In *H. flexuosus* the sides of the thorax are more strongly rounded, and the upper surface is more convex.) Sometimes there is an indistinct rufescent spot at the anterior angle, but usually the thorax is uniformly black. The elytra are elongate, and with the sides parallel: the markings consist of a transverse mark at the base, which is somewhat dilated at the part nearest to the scutellum; three discoidal spots, and two bands; the humeral band is recurved in some specimens so as almost entirely to enclose a small oblong dark area at the shoulder; in others, the inner branch of this band is wanting; the post-medial band often runs inwards and forwards to join the second discoidal spot, but sometimes the spot is free, and the band is almost obliterated. The third discoidal spot often joins the pale edging of the apex of the elytra, the whole outer margin of which is pale. The legs are either pitchy or fuscous; the tarsi testaceous. The anterior tibiæ are rather less broad than in *H. flexuosus*.

Ten specimens of this insect examined by me present no sexual distinctions, still I am strongly inclined to believe that the male

would present some peculiarities, were there one among my specimens. Judging from the descriptions, and from a single male specimen of *H. fossor* which I have had an opportunity of examining, the two insects are very closely allied and might possibly be the same; but when specimens of the same sex are compared, I think it will be found that the insect here described will prove distinct—that the true *H. fossor* will differ from my insect in having the thorax less contracted in front, and the elytra rather broader and less truly parallel. The legs moreover in *H. fossor* are paler. If these suspicions prove to be well founded, I propose that the name *H. rectus* be applied to the present species.*

I have reason to believe my specimens of this insect are from North Wales.

* *H. parallelus* differs from my insect in being rather larger, in having the legs, antennæ and sides of the thorax pale; its thorax, moreover, is more rounded at the sides.

XI. *Description of a new Genus of Carabideous Insects from the Upper Amazon River, Brazil.* By J. O. Westwood, Esq., M.A., F.L.S., &c.

[Read 1st February, 1858.]

In one of the many boxes of insects collected and sent by Mr. Bates from the Upper Amazon River were several specimens of a small beetle of a very peculiar primâ facie appearance or habit, differing from every known form, but having the nearest apparent relationship to certain Heteromerous beetles, such as *Adelostoma*, or the smaller species of *Nosoderma*, &c., as well as to the genus *Rhysodes;* the sub-parallel form of the body, sulcated prothorax and elytra, and obscure luteous covering of the tegument, agreeing with the general appearance of some of the former of these forms. On examining the tarsi it became evident, however, that the insect was Pentamerous, whilst the digitated structure of the anterior tibiæ, the organization of the trophi, and the filiform antennæ, indicated the family *Carabidæ* and sub-family *Scaritides* as the legitimate situation of this remarkable form, although very distinct from all the known genera of that sub-family.

Order COLEOPTERA.

Family CARABIDÆ.

Sub-family Scaritides.

Solenogenys, Westw.

Corpus oblongum, lateribus sub-parallelis, dorso sub-planum, supra obscurum, punctatum, et sulcatum ; collo et parte postica pronoti constrictis, inde corpore quasi tripartito.

Caput magnitudine prothoracis, sub-triangulare, angulis posticis liberis rotundatis paullo-elevatis, margino antico truncato, disco irregulari bisulcato, parteque antica sulcis brevioribus impresso. Caput infra sulcis duobus obliquis profundis postice convergentibus, ante prosternum conjunctis, pro an-

tennarum receptione, marginibus sulcorum valde elevatis, et singulo postice in cornu brevi retro porrecto terminato. Oculi parvi laterales ante medium marginis lateralis inserti.

Antennæ capite vix longiores, sub lobum ante oculos affixæ, filiformes, articulo basali brevi (inde antennæ haud geniculatæ); 3tio reliquis parum longiori, his sensim sed paullo latioribus.

Labrum breve, transversum, angulis anticis rotundatis.

Mandibulæ latæ, breves, trigonæ, apice acutæ, simplices, versus basin externè rotundatæ.

Maxillæ parvæ, apice spina acuta terminatæ, intus spinoso-ciliatæ. Palpi interni graciles biarticulati. Palpi externi articulo 1mo et 3tio parvis; 2ndo longiori, dilatato; 3tio etiam longiori, basi latiori conico-ovato.

Mentum parvum, transversum, antice et postice sinuatum, in medio marginis antici spina acuta armatum. Labium minutum, paraglossis haud porrectis? Palpi labiales parvi, 3-articulati, articulis 2do et 3tio majoribus, hoc conico-ovato.

Collum distinctum, angustum, rotuliforme.

Prothorax sub-octagonus, capite paullo minor, longitudine latitudinem paullo superanti; supra planum, lateribus subcrenulatis, disco longitudinaliter sulcato.

Mesothorax antice valde angustus. Scutellum minutum, vix distinctum.

Elytra oblonga, depressa; prothorace latiora, ad basin angulo prominente instructa; postice rotundata, transversè punctata, singulo 3-carinato.

Alæ magnæ, stigmate magno luteo. Prosternum simplex, inter coxas pedum anticorum elevatum, sed retro haud porrectum. Metasternum breve. Coxæ et trochanteres pedum posticorum magni.

Abdomen subtus 5-annulatum, segmento 1mo in triangulum inter pedes posticos productum. Pedes breves, graciles. Tibiæ anticæ palmatæ, reliquæ spinulosæ. Tarsi 5-articulati, simplices.

SPECIES UNICA.

Sclenogenys fœda, Westw. (Plate I. fig. 14.)

Tota picea, rugosa, punctata, pulvere luteo vestita; pedibus magis brunneis, capite lateribus pone oculos acutis et paullo elevatis, pronoto canali tenui medio longitudinali alterisque

duobus latioribus lateralibus, lobo utrinque postico magis elevato; elytris planis, sutura costisque tribus in singulo elevatis, laterali majori et acuta, corpore infra piceo.

Long. corp. lin. 4; lat. fere lin. 1½.

Habitat in Brasilia, prope fluvium Amazon. Dom. H. W. Bates.

In Mus. Hopeiano, Oxoniæ, et alior.

P.S.—A description and figure, including the structural details given above and represented in the accompanying plate (Plate I. fig. 14—22), were communicated to the Entomological Society on the 1st February, 1858, and a short notice of the communication (sufficiently characteristic however for identification) was published in the Journal of the Proceedings of the Society given in the Zoologist of the following month. Specimens of the insect, however, having been forwarded to Paris, a fresh description and figure of it were published some months subsequently* by Mr. Thomson in his "Archives Entomologiques," under the name of *Aulacinia Rhysodioides*. The description is accurate, and the figures, both of the perfect insect and details, are generally excellent: the costæ on the elytra are, however, too much curved in the figure of the perfect insect, and the pronotum too strongly tubercled. The true character of the legs is also not carefully rendered. The figure representing the underside of the head enormously magnified is unintelligible as regards the under parts of the skull. I find, in fact, nothing of the ornamental details represented within the hind part of the antennary canals, neither is there any truth in the two biarticulated processes represented on the outside of the mentum. The anterior lateral lobes of the piece supporting the mentum extend forwards as far as the insertion of the antennæ, and the apparent second joint in M. Nicolet's figure is in fact nothing else than the deflexed edge of the mandibles: all that is required, therefore, is to scratch out the transverse line at the extremity of this supposed second joint, whereby it will appear what it really is, the interior edge of the mandibles.

* Mr. Thomson's description forms portion of a paper to which the date of 1st February, 1858, is prefixed. This must, however, have been the date when the article was written, since we find in a *preceding* page of the same sheet a note of a letter, *dated from Bahia*, on the 11th March.

DESCRIPTION OF PLATE I.

(Figs. 14—22.)

Fig. 14. The insect highly magnified.
15. The underside of the head.
16. The head sideways, with two basal joints of one of the antennæ.
17. The labrum and mandibles.
18. One of the maxillæ.
19. The mentum and its appendages.
20. The prosternum, with the base of the fore pair of legs.
21. One of the wings.
22. The metasternum and underside of the abdomen, with the base of the hind pair of legs.

XII. *List of the British Species of* Lathridius. By G. R. Waterhouse, Esq., F.Z.S., &c.

[Read Jan. 3rd, 1859.]

1. *lardarius*, De Geer (*Tenebrio*).
——————, Steph. Illustr., and Collection.
——————, Mannerh.
acuminatus, Paykul.
——————, Gyllenhal.
acuta, of Kirby's Collection.

2. *angusticollis* (Schüppel), Gyllenh.
——————, Steph. Illustr., and Coll.
——————, Mannerh.
rugicollis, Steph. Collection.
hirsutula of Kirby's Collection.

In Stephens' Collection are two insects under the name of "*rugicollis*;" one is *C. angusticollis*, and the other *C. minuta*. The description of *L. rugicollis* is from Gyllenhal.

3. *nodifer*, Westwood, Steph.

4. *minutus*, Linn. (*Tenebrio*).
———, Mannerh.
porcatus, Gyll.
———, Steph.
carinatus, Steph. Collection.
hirsutulus, Steph. Coll.
ferrugineus, Steph. Coll.
rugosus, Steph. Coll.
testaceus, Steph. Coll.

L. carinatus is represented in Stephens' Collection by seven specimens of *L. minutus*, and one specimen of *L. transversus*; the description, however, belongs to the true "*carinatus*," being taken from Gyllenhal.

5. *transversus*, Oliv. (Ips.)
——————, Mannerh.
——————, Steph. Illustr., and Coll.

transversus, Marsh. (*Corticaria*).
sculptilis, Gyll.

6. *testaceus*, Waterh.
———, Stephens (not of Collection).

Represented by immature specimens of *L. minutus* in Stephens' Collection. *L. testaceus* is readily distinguished by its short and anteriorly much dilated thorax.

7. *carinatus*, Gyll.
———, Mannerh.

The first British specimens of this insect which came under my notice were in Mr. Wollaston's Collection. Unfortunately at this moment I am unable to furnish their habitat; I have latterly taken several specimens in the corridor of the Crystal Palace.

8. *ruficollis*, Marsh. (*Corticaria*).
———, Steph. Illustr., and Coll.
———, Curtis.
———, (Marsh.) of Kirby's Collection.
Liliputanus, Villa.
———, Mannerh.
collaris, Mannerh.?

Mannerheim unites the *Corticaria ruficollis* of Marsham with the *Latridius constrictus* of Gyllenhal—a very different insect, and one to which the name "*ruficollis*" could never have been applied, since it is uniform testaceous in colour. Judging from Mannerheim's descriptions, I am inclined to refer both the *L. Liliputanus* and the *L. collaris* of that author to the present species; the differences pointed out between the two insects being so slight that it appeared to me I could refer some of my specimens of *C. ruficollis* to the one, and some to the other description, and yet I fully believe my specimens (at least) to be all of the same species.

9. *elongatus*, Curtis.
———, Steph.
———, Mannerh.

In Mr. Stephens' Collection this species is represented by three specimens of the true *L. elongatus* of Curtis, and one specimen of *L. filiformis*, Gyll.

10. *filiformis*, Gyll.
———, Mannerh.

+ XIII. *Characters of undescribed* Neuroptera *in the Collection of W. W. Saunders, Esq., F.R.S., &c.* By Francis Walker, Esq., F.L.S., &c.

[Read August 2nd, 1858.]

Fam. PHRYGANIDÆ.

Genus Phryganea, Linn.

Phryganea divulsa.

Mas.—Cinerea, subtus testacea, antennis fuscis pallido-annulatis, alis anticis fusco-nebulosis, vitta abbreviata interrupta strigaque anteriore discalibus nigris albo-notatis.

Male.—Cinereous, testaceous beneath: antennæ brown, with pale rings; fore-wings mottled with brown, with a black discal abbreviated stripe, which is interrupted in the middle, and is marked with white at the end of each of its two parts; a black discal streak in front of the exterior part of the stripe, marked with white at its inner end. This species much resembles *P. grandis*, but may be distinguished by the much mottled interior border of the fore-wings, and by the difference in the black stripe.

Length of the body $7\frac{1}{2}$ lines; of the wings 19 lines.

Haiti.

Genus Limnophilus, Leach.

Limnophilus griseus, Linn.

A specimen of this species, from Haiti, does not apparently differ from the natives of Europe.

Fam. LEPTOCERIDÆ.

Genus Leptocerus, Leach.

Leptocerus niveistigma.

Fœm.—Nigra, antennis corpore quadruplo longioribus, alis anticis cinereo-subnebulosis stigmate albo oblongo, posticis nigricante cinereis.

Female.—Black: antennæ rather slender, about four times

longer than the body; fore-wings indistinctly marked with grey; stigma white, oblong; hind wings blackish-grey.

Length of the body 4 lines; of the wings 10 lines.

Brazil.

Leptocerus abjurans.

Mas.—Niger, subtus testaceus, antennis testaceis, fusco-annulatis corpore quadruplo longioribus, alis obscure fuscis cupreo vix nitentibus.

Male.—Black, testaceous beneath: antennæ testaceous, slender, with brown rings, about four times the length of the body; wings dark brown, with an indistinct cupreous tinge; hind-wings a little paler than the fore-wings.

Length of the body 4 lines; of the wings 12 lines.

Brazil.

Leptocerus quadrifurca.

Mas.—Niger, subtus testaceus, antennis fuscis, abdomine lurido, alis anticis fuscis, vittis duabus strigaque transversa subapicali biramosa aureo-tomentosis, alis posticis fuscescente cinereis.

Male.—Black, testaceous beneath; antennæ brown, slender; abdomen lurid; fore-wings brown, with two stripes of gilded tomentum; one costal, the other discal; a gilded transverse subapical streak, emitting two branches towards the tip of the wing; hind-wings brownish-cinereous.

Length of the body 4 lines; of the wings 11 lines.

Brazil.

Genus Macronema, Pictet.

Macronema percitans.

Mas.—Nigra, subtus testacea, capite smaragdino, antennis fulvis corpore quadruplo longioribus, thorace vittis quatuor smaragdinis, abdomine lurido fasciis fuscis, alis anticis fuscis, spatio sub-apicali pallido fusco-nebuloso fasciamque fuscam includente, alis posticis cinereis apice fuscescentibus.

Male.—Black, testaceous beneath: head with emerald-green tomentum; antennæ tawny, very slender, somewhat darker towards the tips, about four times the length of the body; thorax with four emerald-green stripes; abdomen lurid, with brown bands; fore-wings brown, paler along the costa, and with a broad,

pale, sub-apical space, which is slightly mottled with brown, and contains an irregular brown, almost interrupted band, which towards the costa is darker than the wing elsewhere; hind wings grey, with brownish tips.

Length of the body $3\frac{1}{2}$ lines; of the wings 10 lines.

Amazon Region.

Genus Musarna, n. g.

Mas et *Fœm.*—Corpus sat gracile. Palpi maxillares pilosi, capitis latitudine breviores; articulus apicalis lanceolatus: palpi labiales breves: antennæ sat graciles; articuli apices versus latiores: pedes nudi; tibiæ posticæ calcaribus apicalibus parvis: alæ amplæ, integræ; anticæ apud costam convexæ, apice rotundatæ.

Male and *Female.*—Body rather slender. Maxillary palpi pilose, shorter than the breadth of the head; apical joint lanceolate: labial palpi short: antennæ rather slender, a little longer or a little shorter than the body; joints slightly widened towards their tips: legs bare; hind tibiæ with short apical spurs: wings ample, entire: fore-wings more or less convex along the costa, rounded at the tips, moderately or very oblique along the exterior border.

Musarna aperiens.

Fœm.—Nigricans, subtus lurida, antennis basi luridis corpore paullo longioribus, alis longis latiusculis fuscescente cinereis, posticis subpallidioribus.

Female.—Blackish, lurid beneath: antennæ lurid towards the base, a little longer than the body; wings long, rather broad, dark brownish-grey; fore-wings convex along the costa, very oblique along the exterior border; hind-wings a little paler and less tinged with brown than the fore-wings.

Length of the body 8 lines; of the wings 30 lines.

South America.

Musarna interclusa.

Fœm.—Atra, antennis corpore paullo brevioribus, alis anticis nigris longis latiusculis apud medium obscure cinereis, posticis nigricante cinereis.

Female.—Deep black: antennæ a little shorter than the body; fore-wings black, long, rather broad, more convex along the costa than in the preceding species, very oblique along the exterior

border; middle part, except along the costa, dark cinereous; hind-wings blackish-cinereous.

Length of the body 8 lines; of the wings 26 lines.

Brazil.

Musarna claudens.

Fœm.—Nigricans, subtus fulva, antennis fuscis, fulvo-annulatis, alis anticis ferrugineo-fuscis latis vix longis, fasciis duabus incompletis e strigis auratis, posticis nigricante cinereis.

Female.—Blackish, tawny beneath: antennæ brown, with tawny wings, as long as the body; fore-wings ferruginous brown, broad, hardly long, more convex along the costa than in the preceding species, moderately oblique along the exterior border, with two slight incomplete bands, composed of short gilded streaks, the one exterior, the other sub-apical; hind-wings blackish-cinereous.

Length of the body 7 lines; of the wings 22 lines.

Brazil.

Fam. PSYCHOMIDÆ.

Genus Curgia, n. g.

Fœm.—Corpus nudum: palpi longi, arcuati, decumbentes; articulus 1us brevis; 2us longus, apice unispinosus; 3us 2o brevior; 4us 3i dimidio non longior: antennæ setaceæ, compactæ, corpore paullo longiores: tibiæ posteriores calcaribus duobus longis apicalibus; tibiæ mediæ calcare uno medio; tibiæ posticæ calcaribus duobus mediis; alæ anticæ angustæ.

Female.—Body, legs and wings bare: palpi long, curved, decumbent, much longer than the breadth of the head; 1st joint short; 2nd long, with a spine at its tip; 3rd much shorter than the 2nd; 4th about half the length of the 3rd: antennæ setaceous, a little longer than the body; sutures of the joints hardly visible: posterior tibiæ with two long apical spurs; middle tibiæ with one middle spur; hind tibiæ with two middle spurs: fore-wings narrow; six apical veins; 1st and 2nd forks of one vein, which is a fork of the radial vein; 3rd and 4th forks of one vein, which, and the 5th, are forks of a discal vein; 6th simple.

Curgia braconoides.

Fœm.—Luteo-rufa, palpis, antennis, tibiis tarsisque nigris, alis nigricantibus anticis albido novem-maculatis et bifasciatis.

Female.—Luteous-red: palpi, antennæ, tibiæ and tarsi black; wings blackish; fore-wings with seven whitish spots between the base and the middle, and with two exterior discal whitish spots, which are between two whitish bands; 1st band abbreviated in front; 2nd much abbreviated hindward.

Length of the body 2½ lines; of the wings 6 lines.

Fam. SIALIDÆ.

Genus Hermes, G. R. Gray.

Hermes decemmaculatus.

Testaceus, capite antice fulvo, maculis duabus posticis lateralibus elongatis nigris, antennis nigris serratis, prothorace maculis quatuor elongatis lateralibus nigris, alis albido-hyalinis, venis testaceis.

Testaceous: head tawny in front, slightly angular on each side, broader than the prothorax, with an elongated black spot on each side hindward; antennæ black, serrated; prothorax slightly contracted in the middle, with two elongated black spots on each side; mesothorax and metathorax a little broader and much shorter than the prothorax; wings whitish hyaline; veins wholly testaceous.

Length of the body 16 lines; of the wings 42 lines.

———?

Hermes corripiens.

Testaceus, antennis nigris basi testaceis non serratis, prothorace guttis quatuor lateralibus elongatis nigris, alis albido-hyalinis, venis testaceis, alarum anticarum venulis transversis plus minusve nigris.

Testaceous: head slightly angular on each side, a little broader than the prothorax; antennæ black, simple, testaceous towards the base; prothorax almost linear, with two elongated black dots on each side; the fore pair sometimes almost obsolete; wings whitish hyaline; veins testaceous; fore-wings with the transverse veinlets more or less black. This species may be distinguished from the preceding one by its narrower head, by the more convex costa of the fore-wings, and by the black marked veinlets.

Length of the body 16 lines; of the wings 36—38 lines.

Fam. HEMEROBIDÆ.

Genus Mantispa, Illiger.

Mantispa compellens.

Fulva, antennis nigris, prothorace tenui cylindrico, abdomine vitta dorsali nigra, pedibus testaceis, femoribus tibiisque anticis fulvis, alis vitreis, stigmate rufescente, venis nigris. Var. B. Abdomine non vittato.

Tawny: antennæ black; prothorax slender, cylindrical, widening towards the head, longer than the coxæ of the fore-legs; abdomen with a black dorsal stripe; legs testaceous; fore-femora and fore-tibiæ tawny; wings vitreous; stigma reddish; veins black; discal areolets elongated, hexagonal or pentagonal, their two longest sides undulating. Var. B. Abdomen without a stripe; fore-femora and fore-tibiæ testaceous; wings with the veins testaceous towards the base.

Length of the body 7—8 lines; of the wings 12—14 lines.

Brazil, Amazon Region.

Mantispa umbripennis.

Nigra, capite lineis duabus flavis, prothorace lineis tribus luteis, abdominis segmentis flavo-marginatis, pedibus fulvis, anticis nigris flavido-vittatis, alis subluridis, costa apice plagaque postica elongata fuscis, stigmate venisque nigris.

Black: head with a yellow line on each side of the face; antennæ short, stout, compact; prothorax cylindrical, wider towards the head, with three luteous lines, as long as the fore-coxæ; hind borders of the abdominal segments yellow; legs tawny; fore-legs black, striped with dingy yellow; wings slightly lurid, brown along the costa and at the tips, and with an elongated brown patch on the hind border; stigma and veins black.

Length of the body 5 lines; of the wings 8 lines.

Natal.

Mantispa lurida.

Picea, capite apud oculos flavo, facie flava vittis tribus nigris, antennis ferrugineis robustis, prothorace lineis tribus fasciaque antica flavis, mesothoracis fascia antica lateribus pectoreque flavis, abdomine ferrugineo vitta dorsali picea, lateribus fasciisque ventralibus flavis, pedibus luteo-flavis, anticis piceo-vittatis, alis luridis stigmate rufescente.

Piceous: head yellow about the eyes; face yellow, with three black stripes; antennæ ferruginous, short, stout, compact; pro-

thorax hardly as long as the fore-coxæ, transversely rugulose, with three yellow lines, wider and with an interrupted yellow band towards the head; mesothorax with a yellow band in front; sides and pectus mostly yellow; abdomen ferruginous, with a piceous dorsal stripe; sides mostly yellow; ventral segments with yellow bands; legs luteous-yellow; fore-legs with piceous stripes; wings lurid; stigma reddish; veins black, tawny at the base and along the costa.

Length of the body 5 lines; of the wings 10 lines.

Genus Varnia, n. g.

Fœm.—Corpus robustum: caput brevissimum: palpi brevissimi: prothorax transversus, sub-quadratus: abdomen crassum, thorace vix duplo longius: pedes simplices, inermes, sat validi: alæ longæ, non latæ, venis venulisque plurimis.

Female.—Body stout, resembling that of *Perla:* head very short, nearly as broad as the prothorax: palpi very short: prothorax sub-quadrate, full twice broader than long; mesothorax somewhat larger than the prothorax, and than the metathorax, which is well developed: abdomen thick, nearly twice longer than the thorax: legs moderately stout, simple, unarmed: wings long, moderately broad, space between the costa and sub-costa with many transverse veinlets, which are most numerous exteriorly; radius emitting several sectors, which are parallel to each other, and are connected by numerous veinlets, and thus form many nearly square areolets; space behind the cubitus with veins and veinlets much like those of the forepart.

Varnia perloides.

Fœm.—Testacea, prothorace vitta strigisque quatuor lateralibus nigris, mesothorace et metathorace fusco-maculatis, abdomine ferrugineo, alis albidis semihyalinis, venulis transversis nigricante marginatis, venis nigris basi testaceis.

Female.—Testaceous: slightly pilose on the sides of the thorax; prothorax with a black stripe, and with two black transverse streaks on each side; mesothorax and metathorax with a brown spot on each lobe; abdomen ferruginous; wings whitish, semihyaline; transverse veinlets with blackish borders; a sub-costal space towards the tip of each wing without transverse veinlets, and accordingly wholly pale; veins black, testaceous towards the base.

Length of the body 10 lines; of the wings 26 lines.

West Australia.

Genus Osmylus, Latr.

Osmylus punctipennis.

Mas.—Piceus, pidibus sordide testaceis, femoribus apice nigricantibus, tibiis nigricante fasciatis, alis vitreis purpureomicantibus, venis viridi-nitentibus, costa setosa, stigmate testaceo et nigricante, alis anticis fusco-sub-punctatis.

Male.—Piceous: legs dingy testaceous; femora blackish towards the tips; tibiæ with a blackish band; wings vitreous, with very brilliant purple reflections; veins with green reflections, with numerous little bristles like those of *O. chrysops;* costa thickly setose; stigma testaceous, partly blackish; fore-wings with a few brown points hindward.

Length of the body 6 lines; of the wings 24 lines.

Hindostan.

Genus Chrysopa, Leach.

Chrysopa ignobilis.

Albida, luteo-univittata, prothorace longiusculo, punctis quatuor lateralibus nigris, mesothorace punctis duobus lateralibus nigris, alis vitreis, venis albis, stigmate sub-testaceo.

Whitish, with a pale luteous stripe; prothorax rather long, with two black points on each side; mesothorax with a black point on each side; wings quite vitreous; veins white, in structure much like those of *C. septempunctata*, but rather fewer; stigma very slightly testaceous.

Length of the body 5 lines; of the wings 14 lines.

Hindostan.

Chrysopa pubicosta.

Testacea, nigro-notata, capite punctis nigris, antennis basi nigris, alis vitreis, venis albis setulosis, stigmate sub-testaceo lituris nigricantibus, alis anticis costa valde setulosa, macula basali, lituris duabus posticis strigaque interrupta fuscis.

Testaceous: head with some black points; antennæ black at the base; thorax and abdomen with various black marks; wings vitreous; veins white, rather setulose; stigma slightly testaceous, with some blackish marks; fore-wings with the costa very setulose; space between the costa and the sub-costa very broad towards the base of the wing; areolets behind the radius somewhat irregular; a brown spot near the base, two brown marks near the

hind border, and an interrupted brown streak on the transverse veins in the disk.

Length of the body 6 lines; of the wings 16 lines.

Hindostan.

Chrysops Mozambica.

Mas.—Lutea, capite supra viridi, prothorace breviusculo latiusculo, margine antico fasciaque bifurcata ferrugineis, mesothorace fasciis duabus angulatis nigris, alis vitreis vix cinerascentibus, venis testaceis nigro-variis, stigmate longo fuscescente nigricante-notato, alis anticis macula postica nigra.

Male.—Luteous: head with the vertex green; prothorax rather short and broad, ferruginous in front and with a ferruginous band which is forked on each side; mesothorax with two angular black bands; wings vitreous, very slightly greyish, very iridescent; veins testaceous, slightly setulose, partly black; stigma long, brownish, with a blackish mark at its interior end; fore-wings with veins much like those of *C. septempunctata;* a black spot on the interior border near the base.

Length of the body 5 lines; of the wings 18 lines.

Mozambique.

Genus Apochrysa, Schneider.

Apochrysa beata.

Mas.—Testacea, gracillima, antennis albidis longissimis, abdomine longo, alis vitreis, venis albidis, tuberculo discali exteriore opalino radiis nigris ornato, stigmate nigricante minimo, alis anticis amplis tuberculo opalino posteriore, posticis puncto marginali nigra.

Male.—Testaceous, very slender: antennæ whitish, very much longer than the fore-wings, and much more than twice the length of the body; abdomen long; wings quite vitreous, with brilliant blue reflections; veins whitish; costa pubescent; space between the costa and the sub-costa very broad; a pearly tubercle with five or six black rays on the exterior part of each disk; stigma blackish, very small; fore-wings ample, with six rows of areolets in the disk, and with a pearly black-rayed tubercle in the hind part of the disk; hind-wings much narrower, with a minute black dot by the interior border near the base.

Length of the body 7 lines; of the wings 22 lines.

Amazon Region.

Genus Drepanepteryx, Leach.

Drepanepteryx falculoides.

Fœm.—Fulva, prothorace sub-quadrato, antennis corporis dimidio vix longioribus, alis anticis sub-falcatis cinereo-variis, costa basi dilatata, margine exteriore inciso, lineis duabus obliquis exterioribus e punctis nigricantibus, alis posticis vitreis vix cinerascentibus.

Female.—Tawny: head almost concealed by the prothorax, which is sub-quadrate; antennæ rather stout, very little more than half the length of the body; wings rather narrow; veins testaceous; fore-wings minutely varied with cinereous, sub-falcate, with two slightly concave notches on the exterior border, which is very oblique; costal space abruptly dilated at the base, and with two rows of areolets, much narrower exteriorly; discal veins very numerous; two exterior oblique lines of blackish points; hind-wings vitreous, hardly cinereous except along the costa; discal veins few; costal space narrow.

Length of the body $3\frac{1}{2}$ lines; of the wings 13 lines.

Hindostan.

Genus Hemerobius, Linn.

Hemerobius decisus.

Fœm.—Pallide luteus, capite litura verticali punctisque duobus lateralibus nigris, antennis fulvis, thorace nigricante, alis cinereis, anticis nigricante-cinereo variis, strigis duabus discalibus obliquis nigricantibus, guttis marginalibus pallidis.

Female.—Pale luteous: head with a black mark on the vertex, and with a black point on each side; antennæ tawny, rather short and stout; thorax blackish; abdomen somewhat darker along each side; wings cinereous; fore-wings thickly varied with blackish cinereous; borders with pale dots, which are largest along the costa; costal space very broad towards the base; two oblique blackish streaks in the disk; veins black, very numerous in the disk, where there are two transverse slightly oblique lines of veinlets; hind-wings a little darker along the costa, where the veinlets are very numerous.

Length of the body $4\frac{1}{2}$ lines; of the wings 13 lines.

Hindostan.

Hemerobius setosulus.

Mas.—Testaceus, capite thoraceque nigricantibus, alis vitreis, venis pallidis, alis anticis fascia informi sub-obliqua e lituris fuscis, punctis marginalibus nigris.

Male.—Allied to *H. hirtus*. Testaceous: head and thorax blackish; wings vitreous; veins pale; fore-wings pubescent, or minutely bristly, varied with brown, which forms an irregular slightly oblique band; borders with black points; costa very broad towards the base of the wing; hind-wings a little darker along the costa.

Length of the body 3 lines; of the wings 7 lines.

Hindostan.

Hemerobius Tasmaniæ.

Mas et *Fœm.*—Testaceus, capite fulvo, fascia vitta punctisque duobus testaceis, thorace lituris fulvis, pedibus albidis, alis angustis sub-vitreis, venis albidis, alis anticis sub-pubescentibus, venis paucis fusco-punctatis.

Male and *Female.*—Testaceous: head tawny, with a band, a stripe and a point on each side hindward testaceous; thorax with some tawny marks; legs whitish; wings narrow, almost vitreous; veins whitish; fore-wings minutely pubescent; veins rather few, with brown points.

Length of the body 2—$2\frac{1}{2}$ lines; of the wings 5—6 lines.

Tasmania.

Genus Berotha, n. g.

Fœm.—Corpus gracile: caput thorace latius: oculi oblongi; antennæ filiformes, basi approximatæ, corporis dimidio paullo longiores, articulis paucis: prothorax sub-quadratus: abdomen compressum, thorace longius: pedes pilosi: alæ angustæ, ciliatæ, sub-falcatæ, venulis transversis paucissimis, margine exteriore perobliquo.

Female.—Body slender: head broader than the thorax: eyes oblong: antennæ filiform, approximate at the base, a little more than half the length of the body; joints few: prothorax sub-quadrate: abdomen compressed, longer than the thorax: legs pilose: wings narrow, ciliated, sub-falcate; transverse veinlets very few; exterior border very oblique: fore-wings with the exterior border slightly concave; space between the costa and the sub-costa narrow, its transverse veinlets forked in front.

Berotha insolita.

Fœm.—Testacea, capite, thorace pedibusque fusco-notatis, alis vitreis sub-cinerascentibus, stigmate nigro-fuscescente, venis alarum anticarum albidis fusco-punctatis, venulis transversis nigro-nebulosis.

Female.—Testaceous: head, thorax and legs with minute brown marks; wings vitreous, slightly greyish; stigma brownish, shaded with black; fore-wings with the costal space decreasing in breadth from near the base to the stigma; veins whitish, with brown points, rather numerous; transverse veins clouded with black.

Length of the body 3 lines; of the wings 7 lines.

Hindostan.

Fam. MYRMELEONIDÆ.

Genus Myrmeleon, Linn.

Myrmeleon tigroides.

Mas.—Pallide luteus, capite thoraceque nigro-vittatis, capitis fascia, antennis pedibusque nigris, thorace vittis tribus nigris, abdomine apicem versus nigro, alis fusco-variis, anticis subcinereis, posticis albidis.

Male.—Structure of *M. speciosus.* Pale luteous: antennæ and legs black; head and thorax with black hairs and with a black stripe; head with a black band between the eyes and with a piceous mark on each side of the end of the stripe; thorax with whitish hairs hindward, with three black stripes; abdomen long, black towards the tip; basal half thickly clothed with pale hairs; apical half more thinly clothed with shorter black hairs; apical appendages short; fore-wings slightly cinereous, with some brown or blackish marks along the costa and along the interior border, with two brown spots in the exterior part of the disk, and with an irregular brown sub-apical band; a brown slightly ramifying discal stripe extending from the base to nearly half the length; two white elongated marks near the hind border, one interior, the other basal; hind-wings whitish, with three broad irregular brown bands, the first nearly joining a brown streak which proceeds from the base, abbreviated hindward, and having opposite to it a subfusiform marginal brown patch, the third including a sub-apical whitish spot.

Length of the body 26 lines; of the wings 51 lines.

Hindostan.

Myrmeleon conicollis.

Ferrugineo-fusca, gracilis, capite lineis flavis, facie flava, palpis longis clavatis, antennis nigris clavatis basi rufescentibus, thorace vittis quatuor flavis, pedibus flavis robustis spinosis, alis longis angustis acuminatis, plagis costalibus liturisque posterioribus fuscis, venis stigmateque albis.

Ferruginous brown, slender: head above with various yellow lines; face and underside yellow; palpi long, slender, with clavate tips; antennæ black, clavate, reddish at the base; thorax with four yellow stripes; abdomen rather shorter than the fore-wings; legs yellow, stout, spinose; spurs as long as the first and second joints of the tarsi; wings long, narrow, slightly angular and acuminated at the tips; veins and stigma white; fore-wings a little broader and hardly shorter than the hind-wings, with four brown costal patches, and with several small brown marks in the disk and along the hind border; hind-wings with three brown costal patches, and with the other marks larger and fewer than those of the fore-wings.

Length of the body 15 lines; of the wings 30 lines.

Amazon Region.

Allied to *M. subdolus.*

This species and the four following agree with *M. immitis* in the structure of the wing-veins, and with them belong to a South American group, which is distinguished by a long slender body, short clavate antennæ and narrow lanceolate wings.

Myrmeleon nigriventris.

Nigricans, gracilis, capitis lituris facieque testaceis, antennis nigricantibus capitatis ferrugineo-lineatis, thorace vittis duabus lateralibus latis lineisque interruptis testaceis, pedibus testaceis validis spinosis, alis angustis acuminatis, stigmate albo, venis nigris albo-fasciatis, venis paucis nonnunquam nigro-nebulosis.

Blackish, slender: head testaceous in front and beneath, and with several testaceous marks above; antennæ blackish, capitate, with a ferruginous line above; thorax with slight interrupted testaceous lines, and with a broad testaceous stripe on each side; abdomen longer than the wings in the male, rather shorter in the female; legs testaceous, stout, spinose; wings narrow, acuminated; stigma white, veins black, with white bands; fore-wings with the

veins occasionally clouded with black along the sub-costa and along the middle of the disk.

Length of the body 14—18 lines; of the wings 24—27 lines.

Amazon Region, Colombia.

Myrmeleon pubiventris.

Mas.—Testaceus, gracilis, capite lituris transversis fuscis, antennis ferrugineis capitatis, thorace vittis quatuor fuscis, abdomine longissimo valde pubescente apicem versus fusco, pedibus validis spinosis, alis acuminatis perangustis sub-testaceis, stigmate pallide fusco, venis fuscis albo-fasciatis.

Male.—Testaceous, slender: head above with transverse brown marks; antennæ ferruginous, capitate; thorax with four brown stripes, which are most regular and complete on the prothorax; abdomen very pubescent, brown towards the tip, much longer than the wings or nearly twice their length; legs short, stout, spinose; wings acuminated, very narrow, with a slight testaceous tinge; stigma pale brown; veins brown, with white bands; hind-wings shorter than the fore-wings.

Length of the body 19—23 lines; of the wings 27 lines.

Amazon Region.

Myrmeleon albidilinea.

Mas.—Ferrugineo-fusca, capitis lineis reticulatis facieque albidis, thorace vittis quatuor albidis, abdomine lineis duabus lateralibus albidis, pedibus testaceis validis spinosis, alis vitreis sub-acuminatis sat angustis, stigmate albo, venis nigris.

Male.—Ferruginous brown: head whitish in front and beneath; vertex reticulated with whitish lines; antennæ black, capitate; thorax with four whitish stripes, the middle pair broader than the lateral pair, and most regular on the prothorax; abdomen a little longer than the wings, with a whitish line along each side for half the length from the base; legs testaceous, short, stout, spinose; wings rather narrow, slightly acuminated, quite vitreous; stigma white; veins black; hind-wings as long as the fore-wings, but narrower.

Length of the body 15 lines; of the wings 25 lines.

Amazon Region.

†*Myrmeleon indiges.*

Mas.—Testaceus, gracillimus, capite fasciis interruptis nigris,

antennis clavatis nigro-annulatis, thorace fasciis quatuor nigris, abdomine nigro longissimo sub-pubescente fasciis testaceis, pedibus nigro-fasciatis, alis vitreis acuminatis perangustis, stigmate obsoleto, venis nigris.

Male.—Testaceous, very slender: head above with interrupted black bands; antenna clavate, with black rings; thorax with four irregular and partly contiguous black stripes; pectus on each side black, with testaceous dots; abdomen black, slightly pubescent, very much longer than the wings, with about eight testaceous bands; legs short, spinose; tibiæ and tarsi with black bands; wings vitreous, acuminated, very narrow; stigma obsolete; veins black, less numerous than in most species; hind-wings as long as the fore-wings, and hardly narrower.

Length of the body $13\frac{1}{2}$ lines; of the wings 15 lines.

Haiti.

Myrmeleon excogitans.

Mas.—Niger, capite antico, palpis et propectore flavis, antennis capitatis testaceo-annulatis, thorace vittis quinque rufescentibus, pectore rufescente, abdomine breviusculo vittis duabus testaceis, pedibus crassis pilosis spinosis longiusculis ex parte fulvis, alis vitreis longis acuminatis sat angustis, stigmate nigricante, venis albis nigro-fasciatis, alis posticis brevioribus.

Male.—Black: head reddish above along the eyes, yellow in front and beneath; palpi yellow; antennæ short, capitate, with testaceous rings; prothorax rather long, slightly conical, with five reddish stripes, yellow beneath; mesothorax and metathorax well developed, also striped, but less regularly; pectus reddish; abdomen with two testaceous stripes, much shorter than the wings; legs pilose, spinose, very stout, rather long, partly tawny; spurs as long as the first joint of the tarsi; wings vitreous, long, acuminated, rather narrow; stigma blackish; veins white, mostly with black bands; hind-wings much shorter and a little narrower than the fore-wings.

Length of the body 14 lines; of the wings 32 lines.

This species may be included in a group with *M. feralis*, *M. distinctus* and *M. fundatus*.

Myrmeleon obducens.

Mas.—Nigricans, gracilis, capite flavo supra nigricante fasciis duabus flavescentibus, antennis sub-clavatis annulis flavescentibus, prothorace vittis tribus flavescentibus, mesothorace

et metathorace vittis duabus lateralibus flavis, abdomine alis vix breviore, pedibus testaceis nigro-subnotatis, alis vitreis angustis acuminatis, punctis exterioribus nigricantibus, anticis litura postica interiore nigra.

Male.—Blackish, slender: head above with two slender yellowish bands; face and underside yellow; antennæ sub-clavate, moderately long, with yellowish rings; prothorax with three yellowish stripes, yellow beneath; mesothorax and metathorax with two yellow lateral stripes; abdomen almost as long as the wings; hind borders of the 1st and 2nd segments whitish, of the following segments tawny; legs testaceous, slender, moderately long, slightly marked with black; wings vitreous, narrow, acuminated, with a few blackish points towards the tips; stigma brownish, not distinct; veins mostly pale, minutely ciliated; fore-wings with a black mark near the hind border at somewhat beyond one-third of the length; hind-wings not shorter, but a little narrower than the fore-wings.

Length of the body 14 lines; of the wings 26 lines.

Hindostan.

Myrmeleon incuratus.

Mas.—Niger, gracilis, nitens, capite maculis duabus testaceis, antennis clavatis brevinsculis, thorace vittis duabus testaceis, abdomine piceo-pubescente, pedibus fulvis, posticis testaceis fusco-subnotatis, alis vitreis, stigmate albido, venis pallidis.

Male.—Black, slender, shining: head with two testaceous spots on each side above, and with some testaceous points beneath; mouth testaceous; antennæ clavate, rather short; thorax with a testaceous stripe along each side; borders of the segments partly testaceous; abdomen piceous, pubescent, shorter than the wings; legs tawny, slender, not long; hind pair testaceous, slightly marked with brown; wings vitreous, moderately broad, very iridescent; stigma whitish; veins pale, ciliated; hind-wings narrower, but hardly shorter than the fore-wings.

Length of the body 11 lines; of the wings 24 lines.

Natal.

Myrmeleon perplexus.

Mas.—Piceus, gracillimus, capite testaceo, vertice piceo lineis transversis testaceis, antennis capitatis testaceo-annulatis, thorace vittis tribus testaceis, abdomine pubescente, pedibus tes-

taceis, alis vitreis acuminatis perangustis, venis posticis fusco-nebulosis, stigmate nigricante.

Male.—Piceous, very slender: head above with transverse testaceous lines; face and underside testaceous; antennæ short, capitate, with testaceous rings; thorax with three testaceous stripes; the middle one slender; abdomen pubescent, shorter than the wings; legs testaceous, short, slender; wings vitreous, acuminated, very narrow; veins white, with black bands, those along the apical part of the hind border clouded with brown; fore-wings a little broader, but not longer than the hind-wings; stigma blackish; veins along most of the length of the hind border clouded with brown.

Length of the body 9 lines; of the wings 19 lines.

Hindostan.

Myrmeleon ambiguus.

Fœm.—Niger, gracilis, capite lituris flavis, antennis clavatis testaceo-lineatis, thoracis segmentis testaceo-marginatis, prothorace guttis duabus testaceis, abdomine breviusculo maculis dorsalibus elongatis testaceis, pedibus testaceo-vittatis, alis vitreis angustis, stigmate venisque albis.

Female.—Black, slender: head yellow along the eyes, and with some yellow marks above; antennæ short, clavate, with a testaceous line; thorax with the borders of the segments testaceous; prothorax with a testaceous dot on each side in front; abdomen much shorter than the wings, with an elongated dorsal testaceous spot on each segment; legs rather slender, not long, striped with testaceous; wings vitreous, narrow; stigma white; veins white, fewer than in most species, very minutely ciliated; hind-wings a little narrower and shorter than the fore-wings.

Length of the body 9 lines; of the wings 20 lines.

Myrmeleon contractus.

Mas.—Niger, subtus testaceus punctis nigris, capite testaceo guttis nigris fasciaque antica lata ferruginea, antennis clavatis testaceo-annulatis, thorace vittis duabus latis testaceis nigro-notatis, abdomine brevi fasciis testaceis, pedibus testaceis nigro-fasciatis, alis vitreis obtusis, stigmate venisque albis, alarum anticarum venis nonnullis fusco-nebulosis.

Male.—Black: underside testaceous, with some black points; head testaceous, with several black dots above, and with a broad ferruginous band on the face; antennæ clavate, short, with testa-

ceous rings; thorax with a broad testaceous black marked stripe on each side; abdomen little more than half the length of the wings, with irregular testaceous bands; legs testaceous, short, with a few black bands; wings vitreous, obtuse, moderately broad; stigma white; veins white, slightly ciliated; fore-wings with the veins along the subcosta, and with a few in the disk, clouded with brown; hind-wings a little shorter and narrower than the fore-wings, with one brown dot in the exterior hind part of the disk.

Length of the body 6 lines; of the wings 18 lines.

Hindostan.

Myrmeleon eccentros.

Mas.—Niger, gracillimus, capitis lituris palpisque testaceis, antennis testaceis longis sub-filiformibus apice nigris, thorace vittis quatuor albido-testaceis, prothorace longissimo, mesothoracis et metathoracis lateribus rufescentibus, abdomine lituris lateralibus ventreque testaceis, pedibus testaceis longis, alis longis acutis vitreis nigricante variis apices versus fuscis, costa apicali subrosea, alis posticis angustioribus longioribus apices versus valde attenuatis.

Male.—Black, very slender: head reticulated with testaceous above, and with a testaceous mark towards the mouth; eyes æneous; palpi testaceous, short; antennæ testaceous, long, slender, hardly thicker towards their tips, which are black; thorax with four slender whitish testaceous stripes; prothorax very long; mesothorax and metathorax reddish on each side; abdomen much shorter than the wings, mostly testaceous beneath, and with some elongated testaceous marks on each side above; legs testaceous, long, slender, with some black points; wings long, acute, quite vitreous, very iridescent, with some black points along the sub-costa and along the hind border, interruptedly brown towards their tips, where the costa is somewhat rosy; veins black; fore-wings moderately broad, with an irregular oblique blackish band near the base, and with two blackish patches; the 1st on the costa, the 2nd on the middle of the hind border, a little beyond the 1st; hind-wings narrower and longer than the fore-wings, much attenuated towards the tips, with an oblique blackish patch on the hind border.

Length of the body 15 lines; of the wings 40 lines.

Natal.

This species, with *M. singularis* and *M. circuiter*, forms a group

which is more remote than any other from the typical character of the genus, and is closely allied to *Chrysopa*.

Myrmeleon insolitus.

Mas.—Testaceus, gracilis, capite atomis fasciisque duabus anticis nigris, antennis sub-clavatis rufescentibus apice nigris, thorace vittis quatuor nigris, prothorace longo, abdomine fasciis latis diffusis nigricantibus, pedibus longis nigro-fasciatis, alis longis angustis vitreis fusco-variis, stigmato albo, venis albis nigro-fasciatis.

Male.—Testaceous, slender: head above minutely speckled with black; face with two black bands; palpi short; antennæ sub-clavate, reddish, with black tips; thorax with four black stripes, which are very broad on the mesothorax, and are almost connected on the metathorax; prothorax long; abdomen shorter than the wings, with broad diffuse blackish bands; legs long, slender, with black bands; spurs as long as the 1st and 2nd joints of the tarsi; wings vitreous, long, narrow, acuminated; stigma white; veins white, with black bands; fore-wings with several various brown marks, and with two exterior brown patches, one on the costa, the other on the hind border; tips brown; hind-wings a little narrower and shorter than the fore-wings; their brown marks fewer.

Length of the body 13 lines; of the wings 29 lines.

Hindostan.

This species approaches closely to the preceding group, but is rather less remote from the usual generic form.

Myrmeleon peculiaris.

Fœm.—Nigricans, gracilis, capite fasciis interruptis testaceis, palpis brevissimis, antennis fulvis longis sub-clavatis apice nigricantibus, thorace vitta testacea, prothorace longo, abdomine ferrugineo basi nigricante, segmentis testaceo-marginatis, pedibus testaceis longissimis nigro-fasciatis, alis vitreis apices versus nigricante fuscis, stigmate subroseo, alis anticis rotundatis striga postica obliqua nigro-fusca, posticis acuminatis longioribus, maculis quatuor sub-apicalibus albis.

Female.—Blackish, slender: head with interrupted testaceous bands; eyes æneous; palpi very short; antennæ tawny, long, sub-clavate, with blackish tips; thorax with a testaceous stripe, which is dilated and abbreviated hindward; prothorax long; abdo-

men ferruginous, much shorter than the wings, blackish at the base; hind borders of the segments testaceous; legs testaceous, slender, very long, with black bands; spurs as long as the 1st and 2nd joints of the tarsi; wings vitreous, moderately broad; apical third part blackish-brown; stigma pale rosy; veins white, with black bands; fore-wings rounded at the tips, about which the blackish-brown hue is paler and slightly interrupted; an oblique blackisk-brown streak on the hind border before the middle; veins slightly clouded along a line in the disk; hind-wings acuminated, longer, but hardly narrower, than the fore-wings; blackish-brown part containing four white spots, two in front and two behind.

Length of the body 12 lines; of the wings 32 lines.

Brazil.

It is allied to *M. gratus*, and represents in America the above-mentioned group, of which *M. circuiter* and *M. singularis* are especially characteristic.

Genus Ascalaphus, Fabr.

Ascalaphus leucostigma.

Fœm.—Piceus, nigro-pilosus, capite apud os testaceo, antennis fulvis corporis dimidio non longioribus clava nigra, thorace maculis testaceis, pedibus testaceis, tarsis nigris, alis vitreis longis, stigmate albo, venis nigris, alis anticis apud costam fuscis.

Female.—Piceous: head and thorax thinly clothed with black hairs; head testaceous towards the mouth; antennæ tawny, half the length of the body; club black; thorax with some dull testaceous spots; abdomen bare, much shorter than the wings; legs testaceous; tarsi black; wings vitreous, long; stigma white; veins black; fore-wings brown along the costa.

Length of the body 16 lines; of the wings 37 lines.

Allied to *A. contrarius*, *A. loquax* and *A. longus*.

Amazon region.

Ascalaphus unicus.

Mas.—Piceus, capite pilis densis nigris, vertice testaceo, antennis rufis nigro-annulatis basi pilosis apice nigris corpore valde longioribus, thorace vitta latissima testacea, abdomine supra saturatè rufo, pedibus ferrugineis, alis anticis vitreis basi fuscescentibus, macula apicali guttisque duabus sub-apicalibus

fuscis, punctis sub-costalibus nigris, posticis cupreo-fuscis macula limpida costali sub-apicali.

Male.—Piceous: head thickly clothed with black hairs, testaceous above; antennæ red, with black rings, almost wholly black towards the tips, pilose towards the base, much longer than the body; thorax pilose, with a very broad testaceous stripe; abdomen deep red above; legs ferruginous; fore-wings vitreous, brownish at the base, with a brown apical spot, and with two brown sub-apical dots, one on the costa, the other on the hind border; a row of sub-costal black points; hind-wings cupreous brown, with a limpid costal sub-apical spot; hind border dilated and forming a rounded angle.

Length of the body 10 lines; of the wings 26 lines.

Allied to *A. subiratus*.

South America.

Ascalaphus sublugens.

Mas.—Piceus, capite pilis densis cinereis, antennis nigris corpore non brevioribus apices versus rufescentibus, abdomine vitta dorsali rufa, pedibus ferrugineis, alis sub-cinerascentibus, venis nigris, alis anticis stigmate testaceo, alis posticis margine postico plaga sub-apicali punctisque costalibus fuscis, stigmate nigro.

Male.—Piceous; head thickly clothed with dark cinereous hairs; antennæ black, mostly reddish towards the tips, as long as the body; thorax pilose; abdomen much shorter than the wings, with a red dorsal stripe, which is obsolete towards the tip; legs ferruginous; wings slightly greyish; veins black; fore-wings with a testaceous stigma; hind-wings with brown points along the costa, brown along the hind border, and with a dark brown sub-apical patch; stigma black.

Length of the body 9 lines; of the wings 22 lines.

This species is probably South American, and is allied to *A. Surinamensis*, and to *A. inhonestus*; it also resembles *A. limbatus*.

Ascalaphus intractabilis.

Fœm.—Ferrugineus, robustus, albido-pilosus, antennis nigris corpore vix brevioribus, abdomine breviusculo maculis indistinctis testaceis, femoribus tibiisque posticis testaceis, alis longis vitreis, vitta exteriore interrupta informi.

Female.—Ferruginous, stout: head and thorax clothed with whitish hairs; head clothed with black hairs in front; antennæ

black, nearly as long as the body; abdomen with indistinct testaceous spots, hardly more than half the length of the wings; hind femora and hind tibiæ testaceous; wings long, vitreous, with an interrupted and somewhat diffuse exterior black stripe; stigma black; veins white, partly black.

Length of the body 13 lines; of the wings 42 lines.

West Africa.

† *Ascalaphus flavilinea.*

Fœm.—Niger, capite testaceo, vertice piceo, antennis nigris basi testaceis corpore brevioribus, thorace fasciis duabus anticis interruptis vittisque quatuor flavis, pectore vittis obliquis flavis, abdomine vittis tribus luteis, pedibus flavis, tarsis nigris, alis vitreis, venis stigmateque nigris, vena sub-costali flava.

Female.—Black: head testaceous, with pale hairs; vertex piceous, with black hairs; antennæ black, testaceous at the base, shorter than the body; thorax with two yellow interrupted bands in front and with four irregular yellow stripes; pectus with oblique yellow stripes on each side; abdomen much shorter than the wings, with three luteous stripes; legs yellow; tarsi black; wings vitreous; veins and stigma black; sub-costal vein yellow.

Length of the body 13 lines; of the wings 34 lines.

Natal.

† *Ascalaphus decrepitus.*

Fœm.—Niger, pilis densis canis, facie testacea, thorace vittis duabus anticis interruptis luteis, abdominis segmentis luteo-marginatis, tibiis flavo-bifasciatis, unguibus rufis, alis vitreis sat angustis, stigmate venisque nigris.

Female.—Black: head, thorax, pectus and abdomen at the base thickly clothed with hoary hairs; face testaceous; thorax with an interrupted luteous stripe on each side in front; abdomen with a luteous band on the hind border of each segment; tibiæ with two yellow bands; ungues red; wings vitreous, rather narrow; stigma and veins black.

Length of the body 14 lines; of the wings 32 lines.

Hindostan.

This species and the preceding one belong to the group which also includes *A. tessellatus*, *A. segmentator*, *A. involvens* and *A. sinister*.

Fam. PSOCIDÆ.

Genus Psocus, Fabr.

Psocus reponens.

Niger, niteus, capite testaceo, antennis sub-pubescentibus corpore longioribus, thorace vittis duabus testaceis, pedibus piceis, femoribus fulvis, alis anticis fasciis quatuor fuscis, 3a antice furcata.

Black, shining: head testaceous; antennæ minutely pubescent, longer than the body; thorax with two testaceous stripes; legs piceous; femora mostly tawny; wings vitreous; veins white; fore-wings with four dark brown bands; the first united to the second, and the third to the fourth, by the hind border; the third forked towards the costa.

Length of the body 2 lines; of the wings 6 lines.

South America.

Fam. EPHEMERIDÆ.

Genus Ephemera, Lin.

Ephemera dislocans.

Picea, subtus ferruginea, thoracis pectorisque lateribus abdominisque apice testaceo-notatis, setis corpore longioribus, pedibus nigris, femoribus ferrugineo-fasciatis, alis anticis vitreis nigro transverse strigatis.

Piceous, ferruginous beneath: sides of the thorax and of the pectus and tip of the abdomen with some testaceous marks; setæ much longer than the body; legs black; femora with ferruginous bands; wings quite vitreous; fore-wings with regular transverse black marks along the costa, and with irregular transverse black streaks in the disk; transverse veins rather few, mostly clouded with black.

Length of the body 4 lines; of the wings 8 lines.

Cape of Good Hope.

Genus Potamanthus, Pictet.

Potamanthus exspectans.

Testaceus, thorace vittis duabus abbreviatis nigris, abdomine lineis quatuor nigris, setis pubescentibus corpore vix brevioribus, alis testaceis, venulis transversis nigris.

Pseudimago.—Testaceous: thorax on each side with a black stripe, which is abbreviated hindward; abdomen with four black

lines; setæ pubescent, nearly as long as the body; wings testaceous; veins testaceous; transverse veinlets black.

Length of the body 5 lines; of the wings 12 lines.

Hindostan.

Genus Palingenia, Burm.

Palingenia continua.

Mas.—Picea, vitta lata albido-testacea, setis validis corpore longioribus, pedibus ferrugineis, alis sub-cinereis, venis nigris robustis, venulis transversis plurimis distinctissimis.

Male.—Piceous, with a broad whitish testaceous stripe, which extends from the head to the tip of the abdomen: setæ stout, much longer than the body; legs mostly ferruginous; wings greyish; veins black, stout; transverse veins numerous, very distinct.

Length of the body 6 lines; of the wings 12 lines.

Amazon Region.

Palingenia annulifera.

Albido-testacea, thorace vittis duabus anticis albis, abdomine vittis duabus lateralibus guttisque dorsalibus nigris, setis albis nigro-annulatis corpore multo longioribus, pedibus albidis nigro-fasciatis, alis vitreis, venis albis, venulis transversis apud costam fusco-nebulosis.

Whitish testaceous: thorax with two white stripes in front; abdomen with a black stripe along each side, and with a minute black dot on the hind border of each segment; the two setæ white, with black rings, very much longer than the body; legs whitish, with some black bands; wings vitreous; veins white; transverse veins towards the costa clouded with brown.

Length of the body 3 lines; of the wings 8 lines.

Hindostan.

Genus Clöeon, Leach.

Clöeon debilis.

Fulva, capite nigro, abdomine testaceo, setis pedibusque albis, illis corpore longioribus, alis vitreis, venis albis.

Tawny: head black; abdomen testaceous; setæ and legs white, the former longer than the body; wings quite vitreous; veins white.

Length of the body $2\frac{1}{2}$ lines; of the wings 6 lines.

Hindostan.

XIV. *Notes on the British Species of* Cissidæ. By G. R. Waterhouse, Esq., F.Z.S., &c.

[Read July 4th, 1859.]

The European species of *Cis*, and allied genera, amount (according to Dr. Schaum's recently published Catalogue) to 42. Hitherto, of British species, I have only seen thirteen or fourteen; hence it is probable there are several yet to be discovered; and, with the view of drawing attention to the group, I will lay before the Society such little information as I possess relating to them. I will, in the first place, state that, soon after the publication of M. Mellié's Monograph in the "Annales de la Société Entomologique de France," (see vol. vi., Second Series, pp. 205, 213,) I endeavoured to determine the species of my own collection, but having doubts as to some of my conclusions, I availed myself of an opportunity which subsequently offered itself, to send my species to the author of the Monograph. These were returned to me with two corrections, and consisted of the following species:— *Cis Boleti*, *setiger*, *festivus*, *oblongus*, *fuscatus*, *Alni*, *bidentatus*, *nitidus*; *Ennearthron cornutum*, and *affine*.

Recently, with the view of determining certain additional species which have come to hand, I have had occasion to re-examine the entire group, and I believe I recognize amongst my captures the *Cis micans* and *C. hispidus*, together with a third species, of which I possess but one specimen, and which I am unable to determine. I have also to add to the list the *Octotemnus glabriculus*, an insect which stands, in Mr. Stephens' collection, to represent the *C. nitidus*.

The species in the Stephensian collection are as follows:—

1. *Cis Boletorum*, which is = *C. Boleti* of Gyllenhal, Mellié, &c., &c., as well as of the "Illustrations," but bears the old Marshamian specific name, it being the *Ptinus Boletorum* of the "Ent. Brit." p. 85, sp. 13.

2. *C. flavus*—represented by immature specimens of the *Cis setiger* of Mellié.

3. *C. concinnus.* Under this name are three species; two specimens marked with a round ticket, which should, therefore, be type specimens, are *C. bidentatus* of Mellié, &c. These specimens, however, can scarcely represent the *Ptinus concinnus* of Marsham, nor have they the Marshamian number attached to them. The other specimens are some of them *C. Boleti,* and one specimen is *C. hispidus.*

4. *C. micans.* Represented by ten specimens, eight of which are *C. Boleti,* and two are *C. setiger.* The description in the "Illustrations" appears to have been taken from Gyllenhal, but to have been abbreviated; and, as far as it goes, belongs to the true *C. micans.*

5. *C. villosulus.* Here the type specimens are Marshamian, and are marked No. 14, on a round label; they should then be the fourteenth species of Marsham's book, and such no doubt (judging from the description) is the case. The *Ptinus villosulus* of Marsham, then, I find to be = *C. setiger* of Mellié. The name "*villosulus*" does not occur in the "Illustrations;" but in Stephens' Systematic Catalogue we find it given as a synonym to *C. micans.* It would appear, however, Mr. Stephens subsequently regarded it as a distinct species, and, in fact, as = *C. hispidus* of Gyllenhal. It is the fifth species in the collection, and the description of *C. hispidus* (which comes between the descriptions of *C. micans* and *C. pyrrhocephalus,* also in accordance with the positions of the species in the collection) is the fifth in the "Illustrations." Moreover, Stephens gives *C. hispidus* as a species he possesses, and if it be not represented by this, it can be no other species in the collection: but the description is evidently taken from Gyllenhal, and belongs to another insect.

6. *C. pyrrhocephalus.* Here I find a Marshamian type, No. 15, of the *Ptin. pyrrhocephalus* of the "Ent. Brit." p. 85, sp. 15. The insect is a variety of the *C. setiger* of Mellié, in which the head, and fore part of the thorax, is pale; the back of the thorax dusky; a condition which the insect often presents.

7. *C. pygmæus.* Represented by a single specimen from

Marsham's collection, bearing the No. 16; it is, therefore, the *Ptinus pygmæus* of the "Ent. Brit." p. 85, sp. 16, and I think is clearly identical with the *C. oblongus* of Gyllenhal and Mellié.

8. *C. rhododactylus.* Represented by one (Marshamian) specimen only, and that in bad condition. It is the *Pt. rhododactylus* of the "Ent. Brit." p. 87, sp. 22, and *appears* to me to be likewise the *C. oblongus* of Gyll. I have examined the specimen more than once, and came to the same conclusion.

9. *C. ruficornis.* Represented by two specimens, neither of them with the Marshamian mark: they are = *C. hispidus* of Mellié.

10. *C. nigricornis.* One specimen only: it is not a Marshamian type, nor does it agree with the description given in the "Illustrations," which is taken from Marsham's work; the antennæ being testaceous, with a brownish club, instead of "black." It agrees with the *C. oblongus* of Gyllenhal.

11. *C. nitidus.* Represented by several specimens of the *C. glabriculus* of Gyll., = *Octotemnus id.* Mellié.

12. *C. fronticornis.* Three specimens, all of which appear to me to be = *C. affinis* of Gyllenhal = *Ennearthron affine*, Mellié.

13. *C. bidentatus* = *C. bidentatus*, Oliv., Gyll., &c.

Besides the above, there is a small series (without name) of *Cis nitidus*; these were given to Mr. Stephens by myself, I believe, subsequent to the publication of the "Illustrations."

The following British species have not been recorded by Mr. Stephens, or have been recorded by mistake:—*C. micans*, *C. hispidus*, *C. festivus*, *C. fuscatus*, *C. Alni*, and *Ennearthron cornutum*.

1. *Cis Boleti*, Scop. Fab. Gyll. Steph. Illustr. iii. 344, 1; Mellié, Annales de la Société Entomologique de France, 2me Série, vol. vi. (1848), p. 238, pl. 2, f. 1.
Ptinus Boletorum, Marsh. Ent. Brit. 85, 13.

Brown, or pitchy-brown; thorax with an indistinct longitudinal ridge, usually with about six shallow depressions, on the disc of which the two largest are on the hinder part, and are separated by the ridge alluded to; the fore part depressed, and the anterior margin (like that of the head) recurved and obscurely notched in the middle, the reflected lateral margin broad; the surface very thickly covered with minute punctures, and somewhat rugulose; elytra rather less thickly covered with small punctures, rugulose, and with interspersed large punctures, which have a tendency to form lines: the pubescence, which covers the body, very short—under a lens of half an inch focus scarcely visible, but giving a delicate silky bloom to the surface; legs and antennæ testaceous, the latter with the club dusky.

This is the largest of our British species, being usually $1\frac{1}{2}$ lines in length; it is very common and widely distributed, being found in the *Boleti* growing upon various trees: it varies much in size and colour; the latter, however, has merely connexion with the degree of maturity or immaturity of the insect,—when immature being, of course, pale testaceous.

2. *Cis villosulus*, Steph. Collection.
   Ptinus villosulus, Marsh. Ent. Brit. p. 86, sp. 14.
   —— *pyrrhocephalus*, Marsh. Ent. Brit. p. 86, sp. 15; Steph. Illustr. iii. 345, 6.
   Cis setiger (Chevrolat), Mellié, l. c. p. 244, 3, pl. 2, f. 9.
   — *flavus*, Steph. Illustr. iii. 345, 3.

This species is more elongate, and usually rather smaller than *C. Boleti;* it differs chiefly in having the thorax narrowly margined behind (the thorax of *C. Boleti* being immarginate behind), the reflected lateral margin narrower, and more strongly setose; the elytra are rugulose and finely punctured, but large distinct punctures, like those of *C. Boleti*, can scarcely be said to exist in the present insect; the pubescence (or rather the short scale-like glistening setæ) is coarser, the individual setæ being tolerably distinct under a lens of half an inch focus; the colouring, moreover, is less uniform, and is frequently fusco-testaceous, or somewhat ferruginous, with the hinder part of the thorax, and the disc of the elytra, more or less dusky. Upon a specimen presenting this colouring Marsham founded his *Pt. pyrrhoeephalus*.

Not uncommon in *Boleti*, in the neighbourhood of London and various other parts. My specimens are chiefly from Hawkhurst, in Kent.

3. *Cis micans*, Herbst, Payk., Gyll., Mellié, l. c. p. 255, 12, pl. 2, f. 14.

I think I am right in identifying with the descriptions of Gyllenhal and Mellié a species of *Cis* which I found in the same *Boletus* with *Cis Boleti* and *Octotemnus glabriculus*, at Hawkhurst, in Kent, and which I have also taken elsewhere.

It has the same form and colouring as *C. Boleti*, but differs in being considerably smaller (full-sized specimens being $1\frac{1}{4}$ lines in length), in having the thorax margined (very narrowly) behind, the surface destitute of impressions, and also without mesial ridge, though on the disc there is often a short smooth line; the lateral reflected margins narrower, the fore part but indistinctly depressed, and the anterior margin less produced, and less recurved; the elytra are rugulose and finely punctured, but present scarcely a trace of large punctures. It agrees with *C. villosulus* in having the thorax margined behind, but differs in being smaller, of a shorter form, and in having the surface of the thorax even, i. e., without keel or depressions. In the nature of the pubescence which covers the upper parts, it is intermediate between *C. Boleti* and *C. villosulus*. The legs and antennæ are testaceous, the club of the latter black, or dusky.

4. *Cis hispidus*, Paykul, Gillenhal, Mellié, l. c. p. 260, sp. 16, pl. 2, f. 17.
Ptinus ruficornis, Marsh. Ent. Brit. 87, 20?
Cis ruficornis, Steph. Coll.

Decidedly smaller than the preceding (large specimens being about $1\frac{1}{8}$ lines in length), and more elongated in form; uniform piceous, with a dense and very glistening pubescence, more distinct than in *C. Boleti*, and varying in colour in different individuals, being sometimes slightly greenish, and not unfrequently red; legs and antennæ entirely testaceous; thorax with the surface even, and very thickly punctured, the fore part considerably produced over the head, but not recurved; the lateral reflected margin narrow; elytra thickly and finely punctured, and with larger punctures arranged in striæ; the striæ, however, are by no means well-marked, though they present a very evident point of distinction when this species is compared with other smallish, pubescent species.

I have found this insect very sparingly at Hawkhurst.

5. *Cis pigmæus*, Steph. Illustr. iii. 346, 7.

Ptinus pigmæus, Marsh. Ent. Brit. 86, 16.
Cis oblongus (Schönh.), Mellié, l. c. p. 341, 46, pl. 3, f. 19.
Cis rhododactylus, Steph. Illustr. iii. 346, 8.
Ptinus rhododactylus, Marsh. Ent. Brit. 87, 22.
Cis nigricornis, of Steph. Collect., not of Marsham?

Rather less than *C. hispidus*, and nearly of the same oblong form, but with the thorax more distinctly contracted in front; pitchy-black, with pale legs and attennæ, and pretty densely clothed with pubescence; thorax rather thickly and finely punctured; elytra finely, but by no means thickly punctured, the punctures rather oblong, the interspaces glossy. See next species for further characteristics.

6. *Cis festivus*, Panz., Gyll., Mellié, l. c. p. 349, sp. 53, pl. 3, f. 24.

Fuscous, or fusco-testaceous, antennæ and legs pale; thorax and elytra thickly punctured and well clothed with scale-like setæ. In size and form this insect comes very near the preceding; it is, however, a trifle less oblong, and differs more particularly in having the punctuation rather stronger and more dense, especially on the elytra. In *C. pygmæus*, the interspaces between the punctures (which punctures are rather oblong) would admit of two, and often three punctures similar to those which exist, whilst in *C. festivus* (where the punctures are round), there is scarcely room for more than one puncture between the existing punctures: here, moreover, the setæ are decidedly stouter and more scale-like than in *C. pygmæus*. The last-mentioned insect (the Marshamian specimen) I have carefully compared with a specimen of *C. oblongus*, presented by M. Mellié to the British Museum, an insect which also agrees with a specimen in my own collection, named by M. Mellié; and when these three specimens are compared with specimens of *C. festivus* from M. Mellié, they present precisely the differences which that author points out in his descriptions.

The two last-mentioned species are each about one line in length; the following is the smallest of the British species.

7. *Cis fuscatus*, Mellié, l. c. p. 352, sp. 55, pl. 4, f. 1.

Scarcely $\frac{3}{4}$ of a line in length, and of a narrow, elongate form, the thorax as broad as the elytra, not contracted in front, the sides gently rounded, the anterior angles obtuse, the posterior angles rounded: general colour fusco-testaceous; well clothed with short

scale-like setæ: thorax thickly and rather finely punctured; elytra with the punctures stronger and less thickly disposed.

Readily distinguished from the preceding by its small size, and more linear form; the puncturing of the elytra is rather less dense than in *C. festivus*, and the punctures are more defined, the intervening spaces being more even; on the other hand, the punctures are stronger and more numerous than in *C. pygmæus*.

I have taken three specimens of this insect, but omitted to record the localities.

The remaining three species are destitute of pubescence or very sparingly furnished, and are black, or pitchy-black in colour.

8. *Cis Alni*, Gyll., Ins. Suec. iii. 386; Mellié, l. c. p. 338, 45, pl. 3, f. 18.

Elongate, sub-cylindrical, pitchy-black and glossy; antennæ (excepting the club, which is more or less fuscous) and legs testaceous; head rather convex, thickly punctured, with a transverse depression immediately in front of the eyes: thorax fully as broad as the elytra, broadly margined at the sides, and very narrowly margined behind, the anterior angles nearly right angles, but slightly produced; the posterior rounded, the surface rather thickly punctured: elytra moderately punctured, the punctures rather less thick and rather stronger than on the thorax—under the microscope is seen, on the hinder margin of each puncture, an exceedingly small and short white seta.

Length about $1\frac{1}{3}$ line.

Distinguished by its elongate form, combined with its glossy pitchy black colour, and the slightly prominent anterior angles to the thorax.

I have formerly taken this insect in more than one locality, of which, however, I omitted to make any notes: this year I found the insect at Hawkhurst, in Kent.

The following two species have the thorax emarginated on each side in front, immediately above the anterior angle, so as to leave the angle somewhat prominent and acute.

9. *Cis bidentatus*, Oliv.; Gyll. iii. 383; Steph. Illustr. iii. 347, 13; Mellié, l. c. 322, 31, pl. 3, f. 5.
Ptinus bidentatus, Marsh. Ent. Brit. 86, 17.
♀ *Ptinus inermis*, Marsh. Ent. Brit. 87, 18.

Oblong convex, with the sides of the body nearly parallel;

black, or pitchy-black, and but moderately glossy; legs and antennæ rufo-testaceous; head depressed in front, and with a shallow fovea in the middle, finely and rather sparingly punctured; clypeus somewhat produced, and, in the male, with two angular tubercles; thorax narrowly margined at the sides and behind, distinctly punctured, the punctures moderately dense; in the male with two tubercles in front, separated by a depressed (slightly concave) interspace. Elytra with the punctures scarcely stronger than those of the thorax, but less numerous; the scales or setæ scant, and scarcely visible even with a powerful lens.

The male of the present species is readily distinguished by its bi-tuberculate thorax; the female, through its shorter form, and the narrowness of the reflected lateral margin of the thorax, could not be confounded with *C. Alni;* whilst, when compared with *C. nitidus*, it would immediately be separated by the more distinct and defined punctuation of the elytra: here the punctures are all alike, whilst in *C. nitidus* there are excessively fine, and larger, punctures intermixed; moreover, *C. bidentatus* is rather larger, ($1\frac{1}{4}$ line), and less glossy than *C. nitidus*, which is usually about 1 line, or rather less, in length.

In *Boleti*, on the ash, at Southend, and in Windsor Forest, &c., &c.

10. *Cis nitidus*, Herbst., Fab.; Gyll. iii. 382; Mellié, l. c. 325, 33, pl. 3, f. 7.

Oblong, convex, glossy, and usually of a deep chestnut colour; legs and antennæ testaceous—the latter with the club dusky; head very slightly convex, the clypeus in the male rather obsoletely bidentate; thorax very narrowly margined at the sides and behind; rather thickly and finely punctured; elytra with exceedingly fine punctures, and larger interspersed punctures, the latter having a tendency, in some specimens, to form rows.

I have found this species in the New Forest, and in Windsor Forest; and I have received it from Scotland. I took specimens of this insect many years back.

I have now to notice three species which have been separated from the genus *Cis* by M. Mellié, chiefly on account of the structure and, more especially, the number of the joints in the antennæ. Those with nine joints to the antennæ form the genus.

Ennearthron, Mellié (l. c. p. 361), which is = Entypus of Redtenbacher (Faun. Austr. Ed. 1849, p. 350).

We possess two species, viz.:—
E. cornutum, Mellié, l. c. p. 362, pl. 4, f. 12.
Cis cornutus, Gyll. Ins. Suec. iv. 626.

A smallish oblong species (being scarcely 1 line in length), and of a testaceous or fusco-testaceous colour, the legs and antennæ paler; antennæ with the two basal joints stout, these followed by two slender joints, of which the first is the longest, then two small transverse joints, and the three-jointed club; the clypeus, in the male, is produced into two pointed tubercles, which are horizontally compressed; in the female transverse, rounded, with the margin recurved, and obscurely emarginate in the middle: thorax with the broadest part very near the posterior angles, gently rounded at the sides, and gradually contracted towards the fore part; in the male with two approximated tubercles in front; in the female with an aggregate of small setæ at the same part, leaving, however, a smooth mesial line; narrowly margined behind and at the sides, the convex upper surface distinctly, but by no means thickly punctured: elytra about $2\frac{1}{2}$ times the length of the thorax, and very little broader; tolerably well furnished with small yellow setæ, more strongly punctured than the thorax, the puncturing not very dense, and having a tendency here and there to form lines.

This insect I have taken recently at Hawkhurst.

Ennearthron affine, Mellié, l. c. p. 364, 2, pl. 4, f. 13.
Cis affinis, Gyll. Ins. Suec. iv. 629.
— *fronticornis*, of Stephens' Collection.

Is considerably smaller (being about $\frac{2}{3}$ of a line in length), and relatively narrower than the preceding, from which it is further distinguished by its pitchy-black colour, less strongly and thickly punctured upper parts, its dull thorax, and less dense setæ on the elytra; these are, however, conspicuous, being white and rather strong, and arranged in rows. The clypeus, in the male, is furnished with two acute tubercles.

Genus Octotemnus, Mellié, l. c. p. 384,* is founded on the—
Cis glabriculus, Gyll. Ins. Suec. iv. 629.
Oct. id., Mellié, l. c. p. 385.
Cis nitidus, of Stephens' Collection.

A small, glossy, pitchy-black insect, bearing a superficial resem-

* The two genera *Ennearthron* and *Octotemnus* were first pointed out by M. Mellié, in the "Revue de la Société Cuviérienne" for March, 1847.

blance to the *C. nitidus*, but decidedly smaller, has the thorax contracted in front, and with the anterior angles obtuse—not produced as in *C. nitidus*. A more marked distinction, however, is seen in the structure of the antennæ, which, instead of being ten-jointed, as in *Cis*, are eight-jointed, viz., two stout joints at the base, followed by an elongate slender joint, then a short obconic joint, and between this and the three-jointed club a small transverse joint; the thorax is finely, but not densely punctured; the elytra are rather finely punctured, and rugulose.

Common in *Boleti*, near London and elsewhere.

XV. *Notes on the Economy of the Ichneumons constituting the Genus* Pezomachus *of Gravenhorst, and Observations on* Pezomachus fasciatus, by Frederick Smith, Esq.; *with a Description of a New Species of* Hemiteles, by Thomas Desvignes, Esq.

[Read July 4th, 1859.]

The observations of Hymenopterists on the species of the genus *Pezomachus* have in some instances tended to prove that these *Ichneumons* are the parasites of parasites. Ratzeburg states that he obtained *Pezomachus agilis*, *P. instabilis* and *P. terebrator* from a species of *Microgaster; Pezomachus cursitans* has been reared from the cocoons of *Cryptus incubator*. Ratzeburg obtained *Pezomachus* from the cocoons of *Lophyrus Pini*, and also from those of *Cimbex variabilis;* in the two latter cases there does not appear to be any proof that the *Pezomachi* did not prey upon the larvæ of the saw-flies themselves; he also obtained *P. instabilis* from the nest of a spider. Dahlbom has reared a species of *Pezomachus* from a small moth belonging to the family *Tineina—Hyponomeuta Evonymellus;* Foerster has recorded the above facts in his Monograph on the genus *Pezomachus*.

Mr. Haliday has also reared a species of *Pezomachus* from the cocoons of *Microgaster intricatus*, as is recorded in the second volume of the "Entomological Magazine."

Mr. Westwood, in his great work on the "Modern Classification of Insects," informs us, that other species of *Ichneumons* deposit their eggs in the silken cocoons of various species of spiders,

and that *Pimpla oculatoria*, *Hemiteles palpator* and *Ichneumon aranearum* are nourished by the eggs of the spiders, and that they undergo their transformations within the spiders' silken cocoon or nest.

During the past summer I collected a number of the nests of a spider, *Agelena brunnea;* these nests may be frequently observed, attached to blades of grass, twigs of heath and other low shrubs; they are about the size of a cherry-stone, and are composed of beautiful snow-white silk, but coated over with a crust of mud, and thus very closely resemble the nest of a species of solitary wasp, *Eumenes coarctatus*, only being rather smaller. The latter circumstance has always induced me to examine these nests, but having usually found them filled with spiders, I have not paid much attention to them. On examining one about the middle of June last, I was surprised to find that it contained three or four oblong cocoons, evidently, as I thought, cocoons of some parasite. Having placed the nest carefully in a glass-topped box, I had the satisfaction, in the course of a day or two, to find four specimens of *Pezomachus fasciatus* developed; this circumstance induced me to collect the large number of the spiders' nests, I obtained seventy-three. The following have been the results: I have had in all twenty-two specimens of *Pezomachus* developed, only in one instance four from one nest, and in six cases three from each. In all the cases in which I obtained *Pezomachus*, not a single spider was likewise developed.

Another parasite on the spider appeared in about equal numbers, but never more than one from a single nest; in every instance, however, four or five spiders were subsequently developed from the same nest as the *Ichneumon*.

This latter parasite belongs to the genus *Hemiteles*, and appears to be a species previously unknown. I am indebted to Mr. Desvignes for having obligingly described the species with great care, under the name of *Hemiteles formosus*.

It appears to me that the fact of the *Pezomachus* feeding upon the spiders and not on the *Hemiteles* is clearly proved, as, in the latter case, spiders as well as *Pezomachus* ought to have been developed; and when we take into consideration the fact of *Pezomachus* being quite as bulky an insect as *Hemiteles*, it can scarcely be supposed that the larva or pupa of the latter could afford nourishment to three or four larvæ of the former.

During the last month not a single insect has been developed, and on opening several of the nests, I found in each, a pupa case

containing a living larva, being I have little doubt that of the *Ichneumon.*

HEMITELES FORMOSUS, Desvignes.

Abdomine rufo, apice nigro, segmentis 2—4 maculis nigris; pedibus anterioribus pallide fulvis, femorum posticorum fulvis apice nigris, tibiis posticis nigris fulvo-cingulatis.

Longitudo $2\frac{1}{2}$—3 linearum.

Caput fascia argenteo-sericea, mandibulis basi rufis. *Antennæ* dimidio corpore longiores, maris basi stramineis, reliquis subtus testaceis, feminæ obscurioribus.

Thorax gibbus, mesothorax antescutellum paululum excavato; metathorace sericeo. *Alæ* amplæ hyalinæ, nervis et stigmate nigris, radice et squamula pallidis, areolâ parvâ. *Pedes* graciles, anteriores pallide fulvæ, coxis et trochanteribus albis aut stramineis; femoribus posticis fulvis aut rufis apice nigris, tarsis et tibiis nigris harum medio annulo fulvo. *Abdomen* elongatum sub-lanceolatum, segmento 1° maris petiolato sublineare apice maculâ flavâ; 2° nigro apice fulvo medio versus basin angulato, 3—4 maculis lateralibus et reliquis nigris. Segmento 1° feminæ paulo latiore quam maris, apice obscure rufo; segmentis 2—4 rufo-castaneis utrimque maculis lateralibus nigris, aculeo vix dimidii abdominis longitudine.

XVI. *Notes on the British Species of* Donacia. By G. R. Waterhouse, Esq., F.Z.S., &c.

[Read 4th July, 1859.]

The *Donaceæ* of our country bear, many of them, the names by which they are almost universally distinguished by the German and French Entomologists, but some few of them bear other names; some, again, have been separated as distinct species, which should not be so separated; and, lastly, some have been mistaken for continental species which we do not possess, though descriptions, compiled from foreign works (and not, therefore, taken from British specimens), have led to the erroneous idea that such species exist in England; and thus we find in such works as Lacordaire's "Phytophages" a wider geographical range given to certain species than they possess. *D. angustata*, *D. obscura* and *D. brevicornis* come under this category; at least, I can find no evidence that these species exist in England. I will now endeavour to point out the leading *distinguishing* characters of our species, and offer such observations upon them as occur to me.

I. Elytra more or less depressed, attenuated at the apex, and truncated at the extreme point.

A. Posterior femora (in the males, at least) bidentate.

Sp. 1. Larger and more depressed than the following three species; posterior femora but indistinctly incrassated, the teeth remote and placed one behind the other; thorax impunctate.—*D. crassipes*, Fab., Gyll., Steph., Lacord., &c.

Found by myself in the London district on the leaves on the water-lily.

2. Male with the posterior femora much incrassated (pale at the base), the teeth placed transversely; thorax rather sparingly punctured; interstices of the striæ on the disc of the elytra smooth, or but little rugulose; third joint of antennæ scarcely half as long again as the second.—*D. bidens*, Oliv., Gyll. (iii. 648), Lacord.; *D. cincta*, Germ., Gyll. (iv. 672), Stephens.

Found by myself in the London district.

3. Male with two tubercles on the basal segment of the abdomen; posterior femora moderately incrassate (entirely pale except on upper surface), the teeth placed one before the other, and somewhat approximated; thorax punctured and thickly rugulose, as are also the interstices of the striæ of the elytra; third joint of antennæ twice as long as the second, or very nearly so: form more oblong than in preceding, and colouring more brilliant, i. e. golden-green, with the inner half of each elytron more or less tinged with cupreous, whilst in preceding species the same part is often blackish.—*D. dentata*, Hoppe, Ahrens, Stephens, Lacordaire, &c.

Found by myself in the London district.

4. Posterior femora in male moderately incrassate, the teeth rather more approximated than in No. 3, and placed obliquely; legs concolorous with the body; thorax scarcely punctured, but with numerous fine rugulæ; punctures of striæ of elytra less strong than in either of the preceding species; third and fourth joints of antennæ nearly equal.—*D. Sparganii*, Ahrens, Germar, Gyll., Lacordaire, &c.: *D. angustata* and *D. Thalassina* of Stephens' Collection; but the description in the "Illustrations" (iv. 269) belongs, no doubt, to the true *D. angustata* of Kunzé, an insect which seems to be peculiar to Southern Europe.

It is remarkable that the author of the "Illustrations," with a considerable series of specimens in his collection (under the name "*angustata*"), all of which have the legs entirely dark and concolorous with the body, should, in his description, have given the legs as "rufo-testaceous."

Found by myself in the London district.

B. Posterior femora of male unidentate.

a. Third joint of antennæ moderately long.

5. Upper parts golden-green, with a broad cupreous band (parallel with, and close to the suture) on each elytron.—*D. dentipes*, Fab., Gyll., Steph., Lacord.

b. Third joint of antennæ short, but little longer than the second.

6. Entirely golden-green above.—*D. sagittariæ*, Fab., Gyll., Steph., Lacord.

   My specimens were taken at Covehithe, in Suffolk, by Mr. Brewer, in June.

7. Rather more convex than the two preceding species; dullish æneous, with a longitudinal cupreous band close within the lateral margin of each elytron, and, generally, a short longitudinal band within this at the base.—*D. Lemnæ*, Fab., Gyll., Steph., Lacord.

   I have recently taken specimens in the Plumstead marches. July.

8. Elongate and narrow (resembling *D. linearis*); usually of a dullish frosted æneous; posterior femora with an acute tooth; thorax rugosely punctured; elytra with two oblong depressions on basal half.—*D. Thalassina*, Germ., Gyll., Lacord. Stephens' Illustrations, iv. 272, 11, but not of Stephens' Collection. The insect which there stands under the name "*Thalassina*" is *D. Sparganii*.

   There are also other specimens of *D. Thalassina* in the cabinet alluded to, standing under the name *D. obscura*. The description of *D. obscura* in the "Illustrations," however, is taken from Gyllenhal.

   My specimens are chiefly from Reigate, being given to me by Mr. Linnell.

9. Less elongate than the preceding, less frosted or dull, being a little glossy; the colour usually rather inclining to cupreous or cupro-æneous; the punctures of the thorax rather finer, but better defined, being less rugulose; elytra less strongly punctate-striate, and with four oblong depressions (the hinder pair in *D. Thalassina* are almost always very obsolete); posterior femora obscurely dentate.—*D. impressa*, Payk., Gyll., Lacord. Stephens' Illustr. iv. 272, 12, but not of his Collection, where *D. impressa* is represented by a series of specimens of *D. Thalassina*, and one specimen of *D. simplex*.

D. impressa, however, is found in the Stephensian Collection under the name *D. brevicornis*. The description in the "Illustrations" of *D. brevicornis* is evidently taken from Gyllenhal, and belongs to an insect which I have been unable to identify among our British species. I possess a fine series of *D. impressa* from Reigate, for which I am indebted to Messrs. Linnell and Brewer.

C. Femora unarmed.

10. Elongate, narrow; above of an uniform frosted green, passing, in different individuals, through cupreous to purple: elytra simply truncated at the apex.—*D. linearis*, Hoppe, Gyllenh., Ahrens, Steph., Lacordaire. *D. simplex*, Fab., Sp. Ins. i. 245, 2; Mant. i. 157, 2; Panz.

I have, in the present month (July), taken this insect near Hammersmith, and in the Plumstead marshes, plentifully.

11. Elytra less attenuated at the apex than the preceding, the extreme point emarginated, and leaving (usually) a slightly prominent outer angle: upper parts frosted golden-green, with a purple interrupted band running parallel with, and close to, the suture.—*D. Typhæ*, Brahm in Ahrens, Nov. Act. Halens. i. 3, p. 37, 19; Kunzé; Gyll. iv. 680; Steph.; Lacord.—*D. linearis*, var. Gyll. iii. 663.

I am indebted to Mr. Brewer for a series of specimens of this insect, which were taken this summer in the neighbourhood of Reigate. I found the insect myself, many years back, at Wandsworth Common.

12. Form rather short, and less depressed than the preceding species; elytra somewhat ovate, rotundate-truncate at apex; upper parts golden-green, slightly glossy, with a cupreous band running parallel with and near the suture, never well defined, often indistinct, and even wanting.—*D. simplex*, Fab. Syst. El. ii. 129, 13; Gyll., Stephens, Lacordaire, &c. *D. melanocephala* (*Leptura* id. Marsham), Stephens. *D. semicuprea*, Panz., Fab., Redt.

I formerly met with this insect in the moat round the palace at Fulham, and have recently received specimens from Mr. Brewer, taken at Covehithe, Suffolk.

13. Elongate; general colour golden æneous, but much hidden by an extremely short, and somewhat dense whitish pubescence: elytra each rather rounded at the apex, scarcely truncate.—*D. hydrochæridis*, Fab., Gyll., Steph., Lacord.

Specimens have been recently received by me from Reigate, where it has been taken by Messrs. Linnell and also by Mr. Brewer.

Note.—In the four preceding species the thighs are pale at the base, and the tibiæ are more or less pale in parts, but the greater portion of each leg is dark, concolorous with the body: the second and third joints of the antennæ are rather short—shortest in *D. simplex* and least abbreviated in *D. hydrochæridis;* they have the thorax densely rugulose and punctured, but in *D. hydrochæridis* the sculpturing of this part is exceedingly fine. In the following species (No. 14) the legs are pale (i.e. rufo-testaceous), and the third joint of the antennæ is elongated, and very nearly equal to the fourth.

14. Elongate; golden-green, glossy; thorax very sparingly punctured and scarcely rugulose.—*D. Menyanthidis*, Fab., Gyll., Steph., Lacord.

II. Body convex; elytra, together, rounded at the apex; posterior femora unidentate.

A. Legs concolorous with the body; feet narrow.

15. Above usually of one colour, but with this colour extremely variable, passing, in different individuals, from golden-green to green, blue-green, blue and black; or to æneous, cupreous and purple.—*D. sericea* (*Leptura* id.), Linn., Illig., Gyll., Lacordaire: *D. Proteus* and *D. micans*, Steph.

Found in the London district, though sparingly, according to my own experience: I have recently taken it near Hammersmith, and in the Plumstead marshes. Extremely abundant (formerly at least) in the Fens of Cambridgeshire.

B. Legs pale; abdomen more or less rufo-testaceous; feet broad.

16. Elongate (length from 4½ lines to upwards of 5 lines); black, often with a slight æneous, or blueish tint, especially on the thorax; this latter distinctly, and rather sparingly punctured, especially on the disc, which is glossy.—*D. nigra*, Fab., Gyll., Steph., Lacord.

    I have during the present month met with this insect very sparingly on reeds in the Plumstead Marshes; and I possess a fine series, from Mr. Brewer, taken at Southwold.

17. Shortish (length from 3½ to rather more than 4 lines); thorax rather thickly punctured.

    Note.—We find together smaller individuals of a blackish colour, with an obscure æneous tint, and in which the interstices of the striæ of the elytra are even, and scarcely rugulose; the thorax contracted behind: others, usually larger, of a frosted golden æneous colour, with the punctate striæ of the elytra stronger, the interstices somewhat convex, and distinctly transversely rugulose; thorax quadrate. The former is no doubt the true *D. affinis*, Kunzé, Lacordaire, &c.; of the latter I have several times seen specimens from the Continent bearing the name "*discolor*," but I suspect it is merely the female of the, usually, blackish insect, which has the antennæ rather longer. With regard to the *D. discolor* of Hoppe, that insect is said to have the thorax sub-cordate, a character which does not apply to our insect, which is the *D. rustica* of Stephens.

Note.—Since the above was communicated to the Society, I have seen two specimens of a *Donacia* (from Scotland), in the collection of Dr. Power, which greatly resemble the *D. Lemnæ*, but which are of an uniform dull bronze colour, and have the tooth to the hinder femur decidedly stronger: they are, no doubt, the *D. obscura* of Gyllenhal, vol. iii., p. 654. The species should follow *D. Lemnæ*.

XVII. *Note on the Habits of* Scolytidæ *and* Bostrichidæ.

By Alfred R. Wallace, Esq., Corr. Memb. Ent. Soc.

[Read December 5th, 1859.]

There seems to be much difference of opinion among Entomologists as to whether the little wood-boring beetles of the families *Scolytidæ* and *Bostrichidæ* do really injure and destroy trees, or whether they only attack such as are already diseased and partially dead from some other cause. Believing that the habits of the exotic species will help to clear up this question, I beg to offer a few observations on those which I have met with in the Malayan Archipelago.

The species of these islands are not generally larger than those of Europe, a great number being about a line in length, and the largest only five lines. They appear to be very numerous in species, about twenty generally occurring in each locality I have visited, while at Dorey, in New Guinea, I captured no less than thirty-eight distinct species, about equally divided between the two families. I have taken about half of these in the house, whenever I have inhabited one newly built in the forest, as at Macassar and Dorey, and the rest under bark in various stages of decay, or flying about fallen trees. Every species has been taken invariably on or in the vicinity of cut or dead trees. Never in the course of five years, almost daily spent in the forests, have I seen a single individual of either of these families attacking healthy living trees, or have found any traces of them having bored into such trees.

On the other hand, whenever a tree falls or is cut down, they are the first to attack it. In about four or five days dozens of minute holes may be seen on the trunk and branches, from each of which a little fine wood-dust falls down, and on carefully watching we may generally discover some of the insects pushing out the dust with the truncate extremity of the elytra. In some trees I have detected two or three species at work, in others only one. Some of the smallest attack cut and drying bamboos, others bore into hard dry boleti. No doubt, however, there are species that attack several trees indiscriminately. I had cut down

a large tree in the Aru Islands, of a kind containing abundance of milky sap, which hardened on exposure to air very much like "gutta percha." A few days after I found on it dozens of a species of *Scolytidæ*, with their abdomens protruding from the holes they had bored, but all dead. With a remarkable deficiency both of *instinct* and *reason*, the little creatures had dug their own graves, and were all glued fast by the hardening of the milky sap. In a few days more there were hundreds so killed; indeed it appeared as if not one escaped. It seems evident, therefore, that this tree could not have been the proper food of this species, or the right place to deposit its eggs. I have since observed exactly the same occurrence in another locality.

In my hut in the Macassar forest, built for me of freshly cut bamboos, palms and timber, the *Scolyti*, *&c.* literally swarmed. In a little more than a month, several pints of wood dust, as fine as flour, had accumulated on the foot of the posts and on some of the beams. In the stillness of evening their never ceasing jaws could plainly be heard at work, producing a slight sharp creak. In this house I took almost all my Macassar species.

Now these facts lead us to conclude that the *Bostrichi* and *Scolyti* attack only dead wood, generally in the first stage of drying or decay; for if their proper and usual food was living wood, why should they all rush as to a feast directly a tree is cut and begins to dry?

It may be said there are other species that attack living trees, but the negative evidence is very strong against such a supposition, which is besides altogether a gratuitous and unnecessary assumption if not supported by direct evidence. In five years' search after insects in the eastern forests I have never met with one, and the thousand sharp eyes of European Entomologists do not appear to have been more successful. This is the more extraordinary, as it is evident that a tree cannot be injured or killed in a moment; weeks, perhaps months, would be required before any part of the wood or bark would become actually dead, and during all this time the little round holes that the insects bore, and the wood-dust that has no other exit, must be easily discovered.

I am led, therefore, to conclude that the *Scolyti*, &c. attack wood in which the vital forces have ceased to act; and they are able to detect this before any external change has taken place. It is only at a later period that we observe the tree to be suffering, and in the parts most affected we discover the *Scolyti* to have been at work, and erroneously impute the mischief to them. As well

might we impute the death of an animal to the flies and their larvæ which a few hours afterwards attack it.

It now becomes a question whether the supposed criminals are not really our benefactors,—teaching us, by their presence, that there is something wrong, before we could otherwise perceive it. We may then be induced to inquire into the state of the soil or of the atmosphere, and be led to examine what diseases or what enemies may be at work on the roots or on the foliage of our trees as the points most likely for decay and death to originate in. Let us not forget that noble maxim of English law,—that every one is to be considered innocent till he is proved guilty; since it is just possible that further inquiry may discover, in the much-abused *Scolytus*, a warning friend instead of an insidious enemy.

XVIII. *Descriptions of South African* Tineina *collected by* R. Trimen, Esq., *in* 1858-9. By H. T. Stainton, Esq., F.L.S., &c.

[Read February 6th, 1860.]

Mr. Trimen not having specially attended to the *Micro-Lepidoptera* in this country before his departure for the Cape of Good Hope, I had not anticipated that he would have brought back with him any representatives of the South African *Tineina*. But in this respect I have been agreeably disappointed. Mr. Trimen brought home three species of the genus *Tinea*, two of the long-horned group, and two of the genus *Hyponomeuta*.

The three *Tineæ* are all new species; of the long-horns, one (*Adela Natalensis*) I had already obtained from Herr Guenzius, who collected for some time at Natal; and the other species, which is the type of a new genus, had already been described by Zeller, under the name of *Ceromitia Wahlbergi*, from specimens collected by Wahlberg in Caffraria. One of the *Hyponomeutæ* likewise appears to have been described by Zeller, but the other seems to be new. Among Mr. Trimen's captures were one or two other *Tineina*, but they were not in a state to be described. Mr. Trimen also brought home several *Tortricina* of interesting forms, but I have restricted myself solely here to the representatives of my own groups.

The species I proceed to describe briefly are—

1. *Tinea rutilicostella*, n. sp.
2. *Tinea Gigantella*, n. sp.
3. *Tinea purpurea*, n. sp.
4. *Adela Natalensis*, n. sp.
5. *Ceromitia Wahlbergi*, Zeller.
6. *Hyponomeuta fumigatus*, Zeller.
7. *Hyponomeuta Africanus*, n. sp.

I trust that when Mr. Trimen next visits us, he will bring back some more species of interest.

1. *Tinea rutilicostella*, n. sp.

Alis anticis saturate brunneis, vitta dorsali lutea, macula disci hyalinali, costa pone medium angustissime lutea.

Exp. al. 8 lin.

Allied to *Tinea Ferruginella*, but larger and darker; the edge of the dorsal streak more of a straight line; but the most distinctive character is the edge of the costa being yellow beyond the middle, as in *T. Imella*.

A specimen was taken at light in November, at Knysna.

2. *Tinea Gigantella*, n. sp.

Alis anticis luteo-ochraceis, parum nitidis, immaculatis; alis posticis griseis, luteo-ciliatis.

Exp. al. 1 m. 1 lin.

Allied to *Tinea Biselliella*, but of gigantic proportions, being far larger than *Tinea ochraceella*. From both those species it is readily distinguished by the more yellow tinge of the anterior wings and by the bright yellow cilia of the posterior wings.

Two specimens were taken at light in February, at Knysna.

3. *Tinea purpurea*, n. sp.

Alis anticis sordide æneis, vix purpureo tinctis immaculatis; alis posticis dilute purpureis; capite luteo.

Exp. al. 9 lin.

Not closely allied to any known species; the purplish hind wings remind one of *T. misella*; but the unspotted anterior wings of a dull bronzy colour, slightly tinged with purple, abundantly distinguish it from that species.

One specimen taken at Knysna in October, sitting on the blossom of a composite plant (*Senecio?*).

4. *Adela Natalensis*, n. sp.

Alis anticis brunneis, fascia sub-obliqua dilute-lutea ante medium, macula costali lutea pone medium ; capite fusca.

Exp. al. 7 lin.

Readily distinguished from all the known long-horns by the oblique fascia and costal spot.

I first obtained specimens of this from Herr Guenzius, at Natal. Mr. Trimen met with several specimens at Knysna, in February.

5. *Ceromitia Wahlbergi*, Zeller.

Alis anticis niveis, parum griseo-irroratis, fasciis tribus obliquis aureo-luteis, quarum duæ posteriores inter se cohærent; capite ac thorace niveis.

Exp. al. 2½ lin.

This pretty species is described by Zeller in his *Lepidoptera Microptera* of Caffraria. Though it has so completely the facies of a *Nemophora*, the structure of the hardly perceptible palpi at once shows that it is generically distinct, and Zeller has done wisely to construct for it a new genus, *Ceromitia*.

Several specimens were taken by Mr. Trimen at Plettenberg Bay in January ; they were flying amongst rushes at sunset.

6. *Hyponomeuta fumigatus*, Zeller.

Alis anticis fumidis, punctis triseriatis ex basi atris, plica albida, fascia postica albida ante puncta 5 sparsa marginem posticum versus ; alis posticis nigris, vix dilutius ciliatis.

Exp. al. 1 m. 1 lin.

A specimen I have before me appears to agree with the *Fumigatus* described by Zeller in his *Microptera* of Caffraria, only a white dash runs along the fold and a whitish fascia precedes the hind margin. Probably, as in the same genus with us, the species is liable to vary ; the black hind wing leads me to believe that the specimen collected by Mr. Trimen is really the *Fumigatus* of Zeller.

One specimen was beaten from a tall shrub at Knysna, in January.

7. *Hyponomeuta Africanus*, n. sp.

Alis anticis niveis, punctis quinque seriatis a basi nigris, maculis duabus cinereis, altera in medio dorsi obliqua, altera minore ad angulum analem ; alis posticis dilute cinereis.

Exp. al. 9½ lin.

Not closely allied to any known species ; distinguished by the

whiteness of the anterior wings, the large size of the spots and the two grey blotches, the first of which placed obliquely near the middle, the second at the anal angle.

One specimen was taken at Knysna, in January.

XIX. *Contributions to an Insect Fauna of the Amazon Valley.* By H. W. Bates, Esq., Cor. Memb. Ent. Soc.

Part I. Diurnal Lepidoptera.

[Read March 5th, 1860.]

In treating of the Insect Fauna of the Amazon Valley in the present and subsequent papers, I shall have to speak of the region, investigated by myself during eleven years' travel and residence, as divided into three great districts; viz. Upper Amazon, Lower Amazon and Pará. It will be necessary, therefore, to commence with defining the limits of these sub-divisions, and adducing some of the reasons for establishing them. The Upper Amazon, then, is that portion of the Valley which, commencing at the eastern foot of the Andes, near the mouth of the Huallaga, in 70° W. long., extends on the north side to the right bank of the river Negro in about 59°; and on the south side to the left bank of the Madeira in 58° 20′ W. long. The Lower Amazon commences at these points, and extends, on the north side, to the mouth of the river at Macapá, and on the south to the left bank of the Xingú, in about 52° W. long. The Pará district, comprising the southern half of the Delta of the Amazon, begins at the right bank of the Xingú and terminates at the mouth of the river near Pará in 48° W. long., including the southern and eastern shores of the island of Marajó.

The three districts thus defined, although forming one and the same river valley, presenting a range of latitude of at most not more than three or four degrees, offer a great diversity in their Zoological productions. If we take as an example the distribution of the species of the first and most conspicuous group of Diurnal *Lepidoptera*,—the genus *Papilio*,—we shall find the following data:—

Total number of species and distinct local sub-species 41

Common to all three districts (seven being widely distributed neo-tropical species)	10
Common to Upper and Lower Amazon only ..	4
„ Lower Amazon and Pará	5
Peculiar to Upper Amazon	12
„ Lower Amazon	2
„ Pará	8

This result in an extent of country offering no great natural barriers to Zoological distribution, situated within the same parallels of latitude, and offering a great uniformity of mean temperature (about 81° Fahr.), will be contrary to the preconceived notions of most Zoologists on the subject. The whole country, too, presents no diversity of elevation, so contrary to other wide continental regions, and the rise from the Atlantic towards the Andes is so slight, that at Tabatinga, 1,500 miles from the mouth of the river, the height is only 650 feet above the sea level. But, in fact, there are other minor climatal conditions which operate, obscurely, but not less effectively, in influencing the animal and vegetable population of a country; and these it is the proper business of a faunist to point out. In the first place, the high lands of Guiana on the north, and of central Brazil on the south, towards the middle part of the Lower Amazons, approximate the banks of the river. They not only diminish the breadth of the river valley and the extent of the alluvial low lands, but they furnish from the detritus of their own igneous rocks a lighter and less prolific soil than that of the rich alluvial plains of the Upper Amazon and Pará. Through the soil the vegetation is affected; the forests are not only less dense and lower in height, but composed of a different class of trees. Through the soil and the scanty nature of the forests the meteorological forces are affected. The dry and the wet seasons are far more strongly contrasted here than in the other parts of the Amazon's course. Whilst at Pará or at Ega there is never a long uninterrupted dry season, rain falling more or less throughout; at Santarem and Villa Nova there is a season of always four, sometimes six months, without a shower; the dry woods become parched, and the periodical phenomena in animal and vegetable life present different features from those of the other two districts. The hills which compose the two ranges of highlands here alluded to are, however, of very small elevation; they are highest between Monte Alegre and Almeirim, below Santarem, where they form a line of flat-topped ridges or truncated pyramids, sometimes bare, sometimes wooded; and with the mag-

nificent river, here three to four miles broad, form, what the botanical traveller Pœppig, who describes with so much feeling the scenery of the Andes in crossing the continent, "eine unbeschreiblich herrliche Landschaft." Westward they terminate on the north at the mouth of the Trombetas, although the elevated land extends as far as the Rio Negro. On the south the hills are conspicuous only along the coast, extending about 100 miles below Santarem; westward the high undulating country continues at some distance from the river, past Villa Nova to the banks of the Madeira. The whole of this district, however, is not quite uniform in its physical features. In the low lands and the islands in mid-river, especially at the mouths of the rivers, the soil and the forests are very similar to those of the other two regions; but the general character of the country is such as I have described, and its zoological characters equally peculiar. The Upper Amazons and Pará, as we have seen, have more resemblance with each other, in their physical features, than either have with the Lower Amazons. Both have extremely humid climates and a uniform low land. The amount of rain which falls in either is probably nearly alike, but the seasons are rather differently apportioned; a circumstance which must affect in some degree animal life. The Pará region, too, is within the influence of the tides; daily the low lands are twice saturated with humidity. The Upper Amazon, on the contrary, has only the periodical rise and fall of the river; six months' ebb and six months' flow. During the one season the soil is left free from humidity, and during the other thoroughly saturated with it. Pará is affected by the daily sea breeze, whilst the Upper Amazon has a generally stagnant, sultry air, or winds of inconstant direction and short duration. The soil, too, is generally much lighter and more sandy in the Pará district than on the Upper Amazon, where it is wholly composed of clay and humus. The breadth of the alluvial plain of the Upper Amazon must be far greater than that of any other part of this great river valley; and throughout the whole region there is the same uniformity of soil and climate. Its insect fauna is very rich, containing many species peculiar to itself. The individuals of the species common to it and the Lower Amazon or Pará are generally larger and more brilliantly coloured, or are subject to remarkable variations, whilst very constant in the other districts. Another feature of its fauna is the resemblance to that of the Andean valleys of Bogotá and Bolivia, a resemblance which increases with every 100 miles in ascending the river. It is well known that the richness of colour, variety of form and number of species of Diurnal *Lepidoptera*, already so great along the Atlantic coasts of South

America, increase as we approach the eastern slopes of the Andes and culminate in the neighbourhood of Bogotá. There is a feature in the atmospheric conditions of this region which ought to be noticed in connection with this subject. Lieutenant Herndon (the American traveller) and M. de Castelnau found on the eastern side of the Peruvian Andes that the barometer and point of boiling water became uncertain guides in the measurement of altitudes. Lieutenant Herndon found that the boiling point at Nauta in Peru gave only 434 feet of elevation above the sea level, and that in descending the Amazons it increased, until, at Ega, the result was 2,052 feet, decreasing thence gradually to the Atlantic. As this result is evidently erroneous, he concludes that there is a great increase of atmospheric pressure towards the foot of the Andes. This phenomenon must have its weight in considering the local conditions as affecting the features of the fauna of the district.

With regard to the relations of the Amazonian fauna to that of other regions of tropical America, I can say very little at present. It has been classed,* together with Columbia, as one province. It has most affinity with that of Guiana and less with that of South Brazil. Recurring again for illustration to the genus *Papilio*, after deducting nine widely distributed Neo-tropical species, eleven of the remaining thirty-two are identical with Guiana species, and five others may be considered as local sub-species of Guiana forms. Three only of the thirty-two are found in Brazil, from Pernambuco southwards, and four in Venezuela. The proportion of these thirty-two local species found in New Granada I cannot at present ascertain.

In compiling the catalogue of species, I shall make as few alterations as possible in the nomenclature of previous authors; the chief innovations will be in the determination of the sexes. I have been constrained to adopt the principle of treating every distinct and constant local variety as a separate form; giving it a separate name, but pointing out always what I have thought to be its true relation to the allied species. I have found it quite impossible to enter into considerations on the geographical distribution of the species without adopting this principle; for when all local varieties (sometimes incorrectly considered so) are forced together under one name and one definition, I think we cannot come to any just conclusions regarding the true relations of species, or make comparisons between different faunas. In following out this system many curious and interesting facts in geographical distribution come out in greater prominence. One is the very different degree of variability of different species, in the

* Woodward's Recent and Ancient Fossil Shells, map and p. 402.

same genus, when distributed over a wide extent of country, and subjected to different local conditions. For instance, of three allied species of *Morpho*, one (*Helenor*, Cram.) is found without any variation at three stations, in 48°, 56°, and 65° long. The second (*M. Menelaus*, L. Cram.) is constant from 48° to 56°, but becomes changed (both sexes) into a well marked and constant variety at 65°; and thence further westward, so completely changed that no individual occurs of the typical form of the species. The third (*M. Achilles*, Cram.) becomes changed from 48° to 56°, and the variety thus produced continues further westward to the exclusion of the type. In another class of species the varieties are not so clearly marked; sometimes a species is quite constant throughout all its individuals in one locality, whilst excessively variable in another, the typical individuals being in a minority, and in a third completely changed into a well marked and tolerably constant variety. In some species and genera the varieties thus produced would be classed by Entomologists, without dissent, as mere varieties and without a distinguishing name, and thus, in systematic works, the fact becomes lost to science. In other species, however, the change becomes so great, under the influence however of the same local conditions as the former case, that no difference of opinion would occur as to their being distinct species. In the following catalogue the nature of these different relations between the species will be mentioned under the head of each.

Gen. Papilio of authors.

Group. 1. *P. Crassus*, and allies.

The species of this group I place first, on account of their evident affinity with the *Ornithopteræ* of Eastern Asia. They have the same stout antennæ, with gradually formed, moderately strong, nearly straight club; similar broad and strong abdominal fold to the hind wings, and pale coloured abdomen in the males. If this relationship be correct, we see how far more highly developed the type has become in the favoured lands of the Eastern Archipelago than in the same latitudes of America. The males of the American species have a bold powerful flight, are seldom seen in the shade of the woods, and are attracted by the moisture on the sandy and muddy shores of the rivers, brooks and pools. The females are oftener seen at flowers on the borders of the forest.

P. Crassus, Cram. 112 C., and authors.

♂ and ♀. The female does not differ in colours of the wings from the male. The species occurs without any considerable variation from Rio Janeiro to Surinam. It is rare at Pará, but is an abundant species at St. Paulo on the Upper Amazon.

P. Belus, Cram. 112 A. B.

The ♂ of this species is very well figured by Cramer. Fabricius and Godart confounded it with *P. Lycidas* (of which *P. Erymanthus* is the ♂) and *P. Numitor*. Boisduval (Sp. Gen. p. 315) professes to describe the ♀, but I doubt whether he had the true *Belus* before him when he drew up the description. He gives, as a character of the ♀, the row of pale spots accompanying the red lunules of the under surface of the hind wing; but I find that individuals of the

male sex have this character; he says also that the abdomen is "sometimes whitish and sometimes blackish;" but, in fact, the white colour of the abdomen is proper to the ♂ alone. In Boisduval's collection, a specimen of ♀ *Lycidas* stands as *P. Belus*, Cramer. *Belus* differs from *Lycidas*, both ♂ and ♀, in many points. The dark, almost uniform bronzed-fuscous colour of the fore wings, and the concolorous abdominal fold of the hind wings (the latter character very well shown in Cramer's figures) are two of the principal points of distinction. *Lycidas* has, in both sexes, a long stripe of a pale yellow colour along the inner side of the abdominal fold. *Belus* occurs in its typical form on the Amazon, only in the upper region. According to Cramer it is found also at Surinam. In other parts of tropical America, from South Brazil to Mexico, it appears to be transformed into a number of strongly-marked local sub-species. It is a rapid and bold flyer, and not an abundant species.

P. Varus, Kollar, Beitr. Ins. Fauna, N. Gran. t. 1, f. 3, 4?

I captured a specimen (and saw many others) of a ♀ *Papilio*, which resembles very much the figure given by Kollar; at flowers on the borders of the forest at Ega, on the upper Amazon. I suspect it to be the ♀ of *Belus*. The true *Belus*, however, I have not yet seen from New Granada, the locality of Kollar's insect. A local representative, or sub-species of *Belus*, the *P. Laodamas* of Felder (Wien. Ent. Monatschr. iii. t. 8, f. 1), however, comes abundantly in collections from that country. It is possible that the *P. Varus* is the ♀ of *Laodamas*, in which case the females of the two allied forms will resemble each other more than do their respective males.

P. Numitor, Cram. 113 B.

This is the local form, or sub-species of *Belus*, which appears to take its place in the Pará district; in the same way as *Laodamas* does in the Andean valleys of New Granada. Cramer's figure is not sufficient to characterize the species. On this account, as well as to distinguish it from *P. Laodamas*, I add a short description of it. ♂ rather smaller than *P. Belus*. Fore wing pointed, outer margin very nearly straight; bronzed-fuscous, with a silky gloss; beneath brown, *spotless*. Hind wing above dark green, glossy; *outer margin darker green, with a sub-marginal row of four or five angular lunules of the ground colour of the wing;* a large, oblong, obliquely-truncated, yellowish-white spot in the middle of the costa, and a row of six smaller, rounded, powdery spots of the same colour across the middle of the wing between the nervures and a little exterior to the cell; beneath dark-brown, with a sub-marginal row of seven large, rounded, sub-lunular red spots, broadly margined with black. Inside of abdominal fold concolorous, as in *P. Belus*. Body and fringe of the wings as in *P. Belus*.

P. Lycidas, Cram. 113 A. ♀; 113 C. ♂ (*P. Erymanthus*).

The male found at Pará, on the borders of rivulets, in the forest and at Ega, abundantly at the commencement of the ebb season, viz. in June and July, in company with *P. Belus*. It differs from *Belus*, besides the white stripe within the abdominal fold, by the lighter, clearer green colour of the fore wings, which are darker only along the basal half of the costa. The fore wings are also more produced at the tip. The pale spot of the costa of hind wings is small, rounded and placed near the external angle of the wing. There is, in some specimens, a row of small pale spots across the middle of the hind wing; varieties strongly marked in this respect would agree with Cramer's description of *Numitor* (vol. ii. p. 25), did not his figure show the concolorous abdominal fold. The ♀ I have seen in Dr. Boisduval's collection; it agrees very well with Cramer's figure, 113 A; the specimen was from Cayenne. The species is therefore now known from Surinam, Cayenne and the most humid parts of the forests of the Amazons. I have not seen it from any other part of America.

P. Polydamas, Lin. Cram. 211 D. E. and authors.

A species widely distributed in Tropical America, being found from Rio Janeiro to Nicaragua. On the Amazons it frequents gardens and semi-cultivated or neglected grounds, making it probable that it, as well as many other species of the same habits and same wide distribution, have been introduced with the clearing of the forests by man.

XX. *Notes on the Geographical Distribution of the* British Butterflies. By H. T. Stainton, Esq., F.L.S., &c.

[Read December 5th, 1859.]

It has been calculated that there are not less than 50,000 different species of *Lepidoptera* on the globe. More than 3,000 species of Butterflies are already known, and it has been computed that the Moths are 16 times as numerous.

In this country the proportion of Moths is much greater, being nearly 30 to 1; but then we are remarkable throughout Europe for our poverty in Butterflies.

As already observed, in the whole world 3,000 species of Butterflies are already known; of these only one-tenth occur in Europe, the tropical parts of Asia and America being by far the most richly populated with this beautiful tribe of insects.

In Central Europe or Germany 186 species of Butterflies have been observed; the remaining 120 European species being peculiar to Spain, Italy, Greece, Russia, or Lapland.

Of the German species, 94 occur in Belgium, but only 65 in England; though we possess one species, *Erebia Cassiope*, which does not occur in Belgium.

All the British Butterflies occur in England, but little more than half (33) are found in Scotland, and scarcely more in Ireland.

Twenty-five species may be considered as generally distributed and common; but it should not be understood that these are everywhere to be met with, but simply that their geographical range is not limited, and that where they find suitable localities we may expect to meet with them, from Norfolk to Killarney, and from the Isle of Wight to Caithness. Some frequent gardens, some meadows, some heaths, some woods, and some hedge rows and lanes.

Twenty-five other species, which all occur in the south-east of England, thin out as we advance northward and westwards; only 5 of them occurring in Scotland, only 14 in Ireland.

Three species, two of which are common in the mountainous part of Scotland, do not occur at all in the south of England.

Seven species are local to particular limited districts in the Midland Counties or south of England.

Three species of rare occurrence in this country must be looked on as stragglers from the Continent; one of these, *Vanessa Antiopa*, has occurred in the south-west of Scotland and at Dunbar.

Two other species, which formerly occurred in restricted English localities, now appear to be extinct there.

It has been observed (in the Entomologische Zeitung for 1850), by Dr. Speyer, who has devoted considerable time to the subject of the geographical distribution of the Butterflies of Germany, that the number of species there decreases from east to west, and from south to north; but the latter circumstance is partly owing to the configuration of the country, the Alps being particularly rich in Butterflies.

That Butterflies are not regularly distributed according to latitude is evinced by the simple fact that in Lapland, which is situated considerably further north than the Shetland Isles, they have enumerated 77 species, whereas Scotland only boasts of 34.

Silesia, on the eastern side of Germany, but in the same latitude as Belgium, has 124 species; about a third more than Belgium, which only numbers 94. Berlin, though further north than Paris, has more species of Butterflies, the numbers being 96 and 89; and the neighbourhood of Berlin is, as any traveller can testify, very monotonous and not particularly likely to yield any extra variety of forms.

In the same way we find that there are fewer species of Butterflies in the western counties of England than in the eastern counties.

Dr. Speyer has suggested that the more continental character of the climate of Eastern Germany, the greater cold in winter and greater heat in summer, was favourable to the development of Butterfly life, and tended therefore to account for the greater number of species there. This theory is certainly corroborated by the distribution of the species with us; their maximum is reached in those portions of England which have the most continental climate.

In respect of the species peculiar to moors and mountains it is needful to bear in mind that it is not latitude that affects their distribution, but the position of the mountain chains of sufficient elevation. Thus the London Entomologist travels north to obtain species which an Entomologist at Brussels would seek in the south; and even in Ireland an Entomologist would need to go southwards to obtain species in Kerry which an Edinburgh Entomologist would seek in the Highlands.

Though *Cœnonympha Davus* is unknown in southern England, simply because we have no boggy mosses there, yet in Bavaria we meet with mosses similar to Chat Moss, near Manchester, and there this insect is again abundant.

From a comparison of the species which occur in Ireland with those found in Scotland, it appears that all the 25 generally common species occur in Scotland, though 3, *Argynnis Selene* and *Euphrosyne* and *Thymele Alveolus*, have not yet been detected in Ireland. Of the more southern forms 14 occur in Ireland, but only 5 in Scotland. On the other hand, one of the mountain species common in Scotland, *Erebia Blandina*, has not yet been found in Ireland; and one straggler, *Vanessa Antiopa*, has occurred in Scotland, but not in Ireland.

In short, 6 species, *Adippe*, *Selene*, *Euphrosyne*, *Alveolus*, *Blandina* and *Antiopa*, occur in Scotland and not in Ireland.

On the other hand, 11 species, *Hyale*, *Rhamni*, *Sinapis*, *Tithonus*, *Athalia*, *Lucina*, *Betulæ*, *Argiolus*, *Œgon*, *Sylvanus* and *Linea*, occur in Ireland, but not in Scotland.

Five families of Butterflies occur with us, two of which are subdivided into sub-families.

Thus the first family, *Papilionidæ*, is divided into *Papilionidi* and *Pieridi*.

The second family, *Nymphalidæ*, is divided into *Satyridi*, *Nymphalidi*, *Vanessidi* and *Argynnidi*.

The three remaining families are *Erycinidæ* (of which it is remarkable that we have only a single representative in Europe), *Lycænidæ* and *Hesperidæ*.

From the accompanying table it will be seen how these families are respectively distributed in England, Scotland and Ireland.

The 25 general and common species are thus distributed amongst the families:—

4 *Pieridi*.....*Pieris Brassicæ*, *P. Rapæ*, *P. Napi* and *Anthocharis Cardamines*.

6 *Satyridi* ....*Lasiommata Ægeria*, *L. Megæra*, *Hipparchia Semele*, *H. Janira*, *H. Hyperanthus*, *Cœnonympha Pamphilus*.

3 *Vanessidi* ....*Vanessa Urticæ*, *V. Atalanta* and *Cynthia Cardui*.

4 *Argynnidi* ..*Melitæa Artemis*, *Argynnis Aglaia*, *Euphrosyne* and *Selene*.

6 *Lycænidæ* ..*Thecla Quercus*, *T. Rubi*, *Chrysophanus Phlæas*, *Polyommatus Alsus*, *P. Alexis* and *P. Agestis*.

2 *Hesperidæ* ..*Thymele Alveolus* and *Thanaos Tages*.

The 25 more southern species are as follows:—

5 *Pieridi*.....*Gonepteryx Rhamni*, *Colias Edusa*, *C. Hyale*, *Aporia Cratægi* and *Leucophasia Sinapis*.
2 *Satyridi* ....*Arge Galathea* and *Hipparchia Tithonus*.
2 *Nymphalidi*..*Limenitis Sibylla* and *Apatura Iris*.
3 *Vanessidi*....*Vanessa Io*, *V. Polychloros* and *Grapta C. Album*.
3 *Argynnidi* ..*Argynnis Paphia*, *A. Adippe*, *Melitæa Athalia*.
1 *Erycinidæ* ..*Nemeobius Lucina*.
6 *Lycænidæ* ..*Thecla Betulæ*, *T. W. Album*, *Polyommatus Argiolus*, *P. Corydon*, *P. Adonis* and *P. Œgon*.
3 *Hesperidæ* ..*Pamphila Linea*, *P. Sylvanus* and *P. Comma*.

Of these 25, one species, *Vanessa Io*, attains the latitude of Edinburgh, on the eastern side of our island, and occurs right across the country, having been found at Falkirk and Renfrew. I have been informed that a specimen has even occurred at Aberdeen, but that must be looked on as an accidental straggler.

Of the remaining 24, 7 stop short at Darlington, 9 at York and 8 at Peterborough. That is, these are, speaking roundly, their northern limits on the eastern side of the island. Several of them travel further north on our western shores; thus *Colias Edusa*, which is unknown at Newcastle-on-Tyne, has appeared in Dumfriesshire, Ayrshire, and in the Island of Arran; and *Argynnis Paphia*, which has not actually occurred quite as far north as Darlington, has been observed at Arrochar, and even in the neighbourhood of Rannoch.

Perhaps it may be interesting to trace on the map the northern limits of these more southern species, thus:—

Vanessa Io.....Edinburgh, Falkirk, Renfrew, Arran (1 at Aberdeen).

7 {
Gonepteryx Rhamni....Darlington, Kendal and Windermere.
Colias Edusa .....Darlington, Castle Eden Dene, Dumfries, Ayr and Arran.
Grapta C. Album.....Darlington, Castle Eden Dene, Carlisle.
Argynnis Paphia.....Scarborough, Richmond, Carlisle (1 Arrochar, 1 Grampians).
Hipparchia Tithonus ..Darlington, Morpeth, Lake District.
Polyommatus Argiolus..Newcastle, Darlington, Carlisle.
Pamphila Sylvanus ....Darlington, Castle Eden Dene, Carlisle (Liverpool, common).
}

9
- *Colias Hyale* ..... York, Manchester in 1842.
- *Vanessa Polychloros*....York, Huddersfield, Carlisle (not at Liverpool; once at Edinburgh, wasted).
- *Argynnis Adippe*.....York, Carlisle; rarely in the western Highlands.
- *Nemeobius Lucina* ....York, Carlisle.
- *Arge Galathea*.....York, Wakefield, Monmouthshire, Cardiff.
- *Thecla W. Album* ....York, Bristol, Tintern.
- *Polyommatus Œgon*....York, Manchester, Liverpool.
- *Pamphila Linea* .....York, Shrewsbury; once at Birkenhead.
- *Pamphila Comma*.....Scarborough, Halton.

8
- *Aporia Cratægi* .....Peterborough, Bristol, Cardiff, Tintern.
- *Leucophasia Sinapis*....Peterborough, Manchester, Liverpool, Lake District.
- *Limenitis Sibylla*.....Colchester, Epping, Winchester, Isle of Wight.
- *Apatura Iris* .....Lincoln, Leicester, Monmouthshire, banks of Severn.
- *Melitæa Athalia*.....Stowmarket, Newport Pagnel, Bideford.
- *Thecla Betulæ*.....Ipswich, Peterborough, Shrewsbury, Machynlleth, N. W.
- *Polyommatus Corydon*..Peterborough, Bristol; always on chalk.
- *Polyommatus Adonis* ..Halton, Bristol; generally on chalk, but on the limestone at Torquay.

Of the three moor or mountain species, *Cœnonympha Davus* is that which is found furthest south in England; it occurs near Uttoxeter, and is plentiful on the mosses between Warrington and Manchester; it also occurs at Thorne Moor, and on wet bogs near Newcastle and near Carlisle. In North Wales it is found in Carnarvonshire. In Scotland it is very general on mosses and hill-tops. In Ireland it occurs in the counties of Cork and Kerry.

Erebia Blandina is first found at Wharfdale in Yorkshire, then at Colne, Kendal, and at Castle Eden Dene. In Arran, Argyllshire, Dumbartonshire and Perthshire it is widely distributed.

Erebia Cassiope is not found further south than Langdake Pikes and Styehead Tarn; it always occurs at a great elevation,

from 1,500 to 2,000 feet above the level of the sea. In Scotland it occurs on Ben Lomond and on some of the Perthshire mountains. In Ireland it occurs in Galway and Donegal.

It is remarkable that neither of the last two species have yet been observed in Wales.

We now come to consider the range of our seven local species, *Papilio Machaon*, *Melitæa Cinxia*, *Thecla Pruni*, *Polyommatus Arion*, *P. Acis*, *Steropes Paniscus*, *Pamphila Actæon*, thus,—

Papilio Machaon occurs in the fens near Cambridge and near Norwich, but we know of no other defined localities for this noble insect, though a few specimens have occurred at Pulborough, in Sussex, and at Herne Bay, in Kent.

Melitæa Cinxia is abundant at Sandown, in the Isle of Wight, and is not scarce at Folkestone; a few specimens have occurred near Stowmarket and Peterborough.

Thecla Pruni—for this we only know one locality, Monk's Wood, in Huntingdonshire.

Polyommatus Arion..Barnwell Wold, Northamptonshire; Chatteris, Cambridgeshire; Rington, in Rutlandshire; Cheltenham, and in South Devon.

Polyommatus Acis ..Lewes, Lower Guiting, formerly at Leominster.

Steropes Paniscus....Bourne, Lincolnshire; Monk's Wood, Hunts, and near Oxford.

Pamphila Actæon....Lulworth, Dorsetshire; said to occur also at Sidmouth, in Devon.

The circumstances which cause the restriction of a few species to such very confined localities is at present unknown to us. They are not so restricted on the Continent. *P. Machaon* and *P. Acis* are universally distributed in Germany, and, with the single exception of *Pamphila Actæon*, all the others are very generally distributed in Germany, though not occurring in every district.

Of the three stragglers in this country—*Pieris Daplidice*, *Argynnis Lathonia* and *Vanessa Antiopa*—the two former seem confined to the southern counties of England, not ranging north of Peterborough, but *V. Antiopa* is most plentiful between the Humber and the Tyne, and has more than once been noticed on the north side of the border.

Of the two species which may be considered extinct with us, one (*Chrysophanus Dispar*) used to be abundant at Whittlesea Mere, but since that was drained, causing cornfields to wave where reeds had formerly held undisputed sway, the insect has dis-

appeared. Similar fen districts still exist in Norfolk and Suffolk; but though the insect has been sought there in its most likely haunts, no recent captures are known.

Of our 25 general and common species, all have been captured in Asia, except *Las. Ægeria.*

15, such as *Brassicæ*, *Rapæ*, *Ægeria*, *Megæra*, *Janira*, *Pamphilus*, *Urticæ*, *Atalanta*, *Cardui*, *Rubi*, *Phlæas*, *Alsus*, *Alexis*, *Agestis* and *Alveolus*, have been met with south of the Mediterranean.

3, *Atalanta*, *Cardui* and *Phlæas*, occur on the other side of the Atlantic.

Cardui, indeed, in perfectly cosmopolitan, occurring all over the globe.

Of our 25 more southern species, all but three occur in Asia; viz. *Tithonus*, *Adippe* and *Lucina*. *Tithonus* even disappears in the eastern half of Germany.

6, *Rhamni*, *Edusa*, *Hyale*, *Sibylla*, *Betulæ*, and *Linea*, extend to Africa.

5, *Rhamni*, *Edusa*, *C. Album*, *Sylvanus*, and *Comma*, have been noticed in America.

Of the remaining 15 species, all occur in Asia but the Alpine *Cassiope* and *Chryseis*.

6, *Machaon*, *Cinxia*, *Actæon*, *Daplidice*, *Lathonia*, and *Antiopa* occur in Africa.

And the last-named also in America.

Thus 59 of our 65 species occur to the east of Russia.

27	,,	south of Mediterranean.
9	,,	cross the Atlantic.
1	,,	is universal.

Mr. Watson, in his "Cybele Britannica," has divided our British Flora into what he terms the British, English, Germanic, Atlantic, Scottish and Highland types.

It will be seen at a glance that the first division here corresponds to the British type of plants; the second division, the more southern species, to the English type of plants; but unless we refer the three moor and mountain species to the Highland type, we cannot follow the same system of classification any further.

We have not a single Butterfly peculiar to our west coast, nor a single one peculiar to the north; the circumpolar species which occur in Lapland do not reach us, neither have we any one species peculiar to the eastern coast of England. We simply trace, as we advance northwards, a gradual decrease and diminution of species; every one of our species occurs plentifully in southern Germany.

XXI. *Descriptions of some new Species of* Sagra; *Remarks on that Genus; and the Characters of* Cheiloxena, *a new Genus belonging to the same Family.* By J. S. Baly, Esq.

[Read June 4th, 1860.]

In the following paper I have endeavoured (as completely as the materials before me will allow) to bring our knowledge of the genus *Sagra* from the date of M. Lacordaire's valuable work up to the present time; it will be seen that I have reduced some of the Lacordairian species to mere varieties, whilst, on the other hand, I have named and described others lately added to our collections, which I believe to be new; at the end of the paper I have given a list of the species, marking with a † those with which I am unacquainted.

Sagra nigrita, Oliv.

During the last few years this insect has been received plentifully from Mr. Thwaites, of Ceylon, thus proving (as M. Lacordaire imagined) that the locality given by Olivier in his great work was erroneous; I possess two male specimens which, instead of being entirely black, as in the type, are nigroæneous; they agree in all particulars, save locality, with *S. dentipes*, the next species in Lacordaire's book. I cannot but think that Fabricius and Weber were wrong in supposing this latter insect to have been brought from the Cape of Good Hope; according to the description given by Lacordaire, it is much more nearly allied to the Indian, than to any known African species, and, in all probability, will eventually prove to be a mere variety of *S. nigrita*.

Sagra splendida, Weber.

This insect is spread over the whole Indian continent. I have also received it from Shanghai, where it was taken by Mr. Fortune; the specimens from India are generally much darker and more deeply tinged with violet; those from northern China are a third smaller than the ordinary size.

Sagra Petelii.

I have examined six examples of the male of this beautiful little species, but in one specimen only have I found the posterior

tibiæ to agree exactly with Lacordaire's description; in all the rest there are rudiments, more or less distinct, of a sub-apical tooth on the inner edge. The species is most commonly sent from Java, but I possess it also from Nepaul, and it has been taken by M. Mouhot in Siam, the specimen being in Mr. Saunders's Collection; in the British Museum is a small female from Tenasserim.

Sagra perlucida, Lacord.

I consider, for the reasons stated below, this insect to be a variety of *Sagra Buquetii;* M. Lacordaire has subdivided his first division of the genus into three sections, the characters for which are drawn from the toothing of the apex of the posterior tibiæ in the males; thus, in section A., the hinder tibiæ have this part of the limb tridentate; in section B. the internal tooth is obsolete, whilst the outer one is produced into a strong spine; and in section C., the one in which *S. perlucida* is placed, the tibiæ are simple and unarmed in either sex. The insects contained in this section resemble, in a most remarkable manner, corresponding species in one or other of the two preceding subdivisions, differing merely in their somewhat smaller size, in the lesser development of the hinder thigh, with sometimes a slight modification of its under surface, and in the absence of the lateral teeth on the posterior tibiæ. The possession of an interesting series of *S. nigrita*, in which the teeth dwindle away until they become nearly obsolete, first led me to suspect that the above insects were males in which an arrest of development of the posterior legs had taken place, and that their typical forms belonged to the preceding sections. After a careful examination of *S. ignita*, *Weberi* and others, I was fully confirmed in this opinion, and in the present paper I have placed these insects as varieties under the respective species to which I consider them to belong; at the time M. Lacordaire wrote, he had, in most instances, so limited a number of specimens under examination, that it was impossible to avoid separating insects with such an apparent difference of structure, unconnected by any intermediate link. An analogous instance may be adduced in the case of *Lucanus cervus*, where the development of the male mandibles varies so greatly in different individuals, as to have caused the extreme states to be described under separate names.

I have never seen an insect answering exactly to the description, as given by Lacordaire, of *S. perlucida*, but I possess small individuals of *S. Buquetii*, ♂, in my own cabinet, in which the sub-apical teeth are reduced to less than half their usual size.

Sagra ignita, Lacord.

In this insect, which ought to be placed under *S. splendida*, the under surface of the hinder thighs is generally tridentate, the middle tooth being longest; the additional tooth is formed by the development of the anterior extremity of the denticulate ridge of the lower edge of the thigh, into a short spine. The specimen in my cabinet has a rudimentary tooth on the inner edge of the hinder tibiæ.

Sagra formosa, Lacord.

I consider this insect to be the corresponding variety of the Indian form of *S. splendida;* a specimen exists in the collection of Major Parry.

Sagra Weberi, Lacord.

The present insect belongs to *S. Druryi;* most frequently the posterior thighs are bidentate beneath, as in the typical form of the species, but occasionally they are tridentate, as in the two preceding insects; it then becomes *S. tridentata*, Fabr.

Sagra Fabricii, Lacord.

This form is unknown to me, but I have no hesitation in placing it as a variety of *S. superba.*

Sagra pygmæa, Lacord.

With this pretty little insect I am also unacquainted, but although the tomentose patch at the inner base of its hinder thigh is wanting, I regard it as merely a small variety of *S. Petelii.*

Sagra heterodera, Lacord.

This singular insect is evidently a variety, belonging to a species the typical form of which is as yet unknown; it ought probably to stand in the first sub-section, near *S. splendida.*

Sagra seraphica, Lacord.

Two specimens from Old Calabar, both females, apparently belonging to this species, exist, one in the British Museum, the other in my own collection; others I believe are to be found in the cabinets of Mr. Murray and M. Javet, but I know not whether either of these gentlemen possess the *male.*

Sagra Adonis, Lacord.

Is possibly a variety (analogous to var. A. of *S. bicolor*) of the last species, *S. seraphica.*

Sagra Pfeifferi, n. sp.

Oblongo-ovata, crassa, viridi-ænea, cæruleo micans, sub-nitida, antennis extrorsum nigris; thorace sub-quadrato, antice vix producto, angulis anticis parum prominulis; elytris ovatis, basi truncatis, intra humeros modice impressis, tenuiter reticulato-strigosis, interstitiis ad apicem crenulatis; gemellato-punctato-striatis, striis fere deletis.

Mas.—Femoribus posticis valde incrassatis, elytris fere dimidio superantibus, subtus apice profunde sinuatis, sinu intus fulvo-tomentoso, dentibus duobus validis armatis, horum secundo ad angulum posticum emarginationis posito; tibiis posticis apice mucronatis, ante apicem bidentatis, dente externo valido; abdominis segmento basali vix deplanato, remote punctato, vage flavo-tomentoso.

Long. 10 lin.

Robust, ovate, resembling *S. quadraticollis* in form, but rather shorter and thicker than that insect, bright metallic green, with metallic blue reflexions, sub-nitidous, outer half of antennæ black, opaque. Head finely punctured; antennæ robust, two-thirds the length of the body, six basal joints shining metallic green. Thorax sub-quadrate, almost transverse across the anterior angles, the latter moderately prominent, anterior margin very slightly produced; upper surface sub-opaque, impressed near the basal margin with a shallow fovea; sparingly covered near the base by a few very minute punctures, only visible under a lens. Scutellum semi-ovate, its base deeply excavated. Elytra shorter, ovate, truncate at the base, their apex sub-acutely rounded; above very convex, moderately impressed within the shoulders, the latter somewhat prominent, basilar space indistinctly elevated, bounded beneath by a nearly obsolete transverse depression; surface covered with fine irregularly confluent grooved lines, more crowded towards the apex, where their interstices are raised, and form irregular crenulations; on each elytron are six or seven double rows of punctures, visible only here and there, principally on the anterior half of the surface, being entirely obliterated for the remainder of their course; on the outer disc, just before its middle, is a small smooth spot, shining blue-green.

Male.—Posterior thighs strongly incrassate, extending beyond the elytra for nearly half their length, their outer surface very convex, the thickest portion of the thigh being across its middle; lower edge deeply notched at the apex and armed with two stout teeth, the anterior larger and situated immediately in front, the other placed just at the posterior angle of the notch, the inner

edge of which is clothed with fulvous hairs; hinder tibiæ curved at the base, thence nearly straight to the apex, the middle portion slightly flexuose; apex strongly mucronate, armed on either side with a stout tooth, the outer one large and slightly curved, the inner one very short; inner edge notched at the base, deeply grooved and sparingly clothed with pale pubescence; basal segment of abdomen flattened, remotely punctured, very sparingly dotted with a few fulvous hairs.

Hab. Borneo; collected by the late Madame Pfeiffer.

I know but a single specimen (in my own collection) of this fine insect; it bears a very much stronger resemblance to *S. superba* and *quadraticollis* than to *S. Druryi* and its congeners, with which insects, however, from the possession of a second tooth at the apex of the lower edge of its hinder femora, it must be placed; but the position of this tooth is very different—instead of being situated in the notch itself, as in the above species, it is placed at its posterior angle.

Sagra Javeti, n. sp.

Oblonga, postice attenuata, viridi-cuprea aut rufo-purpurea, sub-nitida, tarsis antennisque nigris, his dimidio corporis paullo longioribus; thorace sub-quadrato, sub-remote fortiter punctato, margine antico modice producto, medio sinuato, angulis anticis sat prominulis; elytris sub fortiter punctato-striatis, infra humeros valde impressis, basi elevatis.

Mas.—Femoribus posticis elytra valde superantibus, supra apicem versus non compressis, intus ad marginem inferiorem prope basin laxe flavo-tomentosis, subtus obsolete denticulatis, apicem versus breviter sed fortiter bidentatis, tibiis ejusdem paris apice uncinatis, extus pone medium spinâ validâ arcuatâ armatis.

Fœm.—Femoribus posticis elytra vix superantibus, subtus tenuiter denticulatis, apicem versus cretâ denticulatâ instructis, tibiis ejusdem paris apice mucronatis.

Var. A. *Mas.*—Minor, femoribus posticis subtus tridentatis.

Long. 7 lin.; *var.* 5½—6 lin.

Oblong; metallic green or cupreous, stained with rufo-aureous; antennæ and tarsi black. Head with the vertex deeply and somewhat closely punctured; antennæ robust, more than half the length of the body, six basal joints shining, the rest semi-opaque. Thorax slightly longer than broad, its anterior margin moderately produced, obsoletely sinuate, anterior angles somewhat strongly

prominent; sides sinuate; above deeply but not coarsely punctured, punctures irregularly crowded, more scattered and distant on the disc; on the centre of the latter is an indistinct longitudinal ridge, and at its extreme base a distinct fovea. Elytra obovate, their base truncate; basilar space considerably elevated, bounded below by a deep transverse depression; shoulders moderately prominent, impressed on their inner margin with a deep oblique fovea; surface distinctly punctate-striate, the puncturing, which is visible to the extreme apex of the elytra, confused and irregular towards the sides; interspaces finely aciculate-reticulate, the reticulations on the outer side of the shoulder vermiculate. Body beneath distinctly punctured.

Male.—Posterior pair of thighs extending considerably beyond the apex of the elytra, elongate-incrassate, their upper edge produced in front into a broad but slightly elevated ridge, which becomes lost on the apical third of the thigh, the latter portion slightly depressed and obliquely rounded, its extreme apex being deeply notched; lower edge compressed into an obsoletely toothed ridge, and armed immediately before the apex with two short stout teeth, the anterior somewhat larger; inner surface longitudinally carinate, its lower half sparingly clothed at the base with a few scattered fulvous hairs; tibiæ of the same pair strongly flexuose, their apex strongly mucronate, outer edge armed with a stout elongate curved spine. Basal segment of abdomen longitudinally excavated, coarsely punctured, and, together with all the other segments, covered with coarse yellow hairs.

Female.—Posterior pair of thighs furnished before their apex beneath with a short denticulate ridge; tibiæ simple.

Var. A. Smaller; thighs of the *male* tridentate beneath.

Hab. Port Natal.

This species may be separated from its congeners by the different form of the apical third of the upper surface of its hinder femora; the general form of the body is also shorter and stouter than in any of the allied species.

Sagra Stevensi, n. sp.

Elongato-oblonga, obscure metallico-viridis, sub-nitida, thorace tenuissime punctato, transverso (apice modice producto prætermisso), lateribus fere rectis, angulis anticis modice prominulis; elytris basi sat elevato-marginatis, intra humeros valde sulcatis; infra basin vix transversim impressis, tenuiter punctato-striatis, striis per paria sat approximatis, apicem versus deletis, interstitiis tenuissime punctatis, tenuiter reticulato-aciculatis.

Mas.—Femoribus posticis elytra modice superantibus, validis; intus ad basin flavo-tomentosis; supra apicem versus compresso-dilatatis et ibi carinatis, subtus ante apicem dente valido trigono armatis; tibiis ejusdem paris flexuosis, apice mucronatis, extus pone medium dente elongato arcuato instructis; abdominis segmento primo complanato, remote punctato.

Long. $8\frac{1}{4}$ lin.

Dull metallic-green, sub-nitidous, obscurely stained with purple; antennæ black, basal joints obscure purple. Head with its vertex finely punctured; antennæ robust, longer than half the body. Thorax slightly broader than long, anterior margin moderately produced, anterior angles sub-prominent, obtuse; upper surface minutely punctured, impressed at the base with a broad shallow fovea; scutellum small, semi-ovate, shining black. Elytra oblong-ovate, truncate at the base, narrowed towards their apex, convex, their extreme base between the shoulders deeply impressed, the basal margin itself being elevated into a narrow ridge; shoulders slightly prominent, their inner edge bounded by a deep longitudinal fovea; basilar space bounded beneath by an indistinct transverse impression; surface covered with fine punctures, arranged in longitudinal striæ, approximating in pairs and becoming obsolete towards the apex of the elytra; interspaces minutely punctured, very finely reticulate-aciculate. First segment of abdomen distinctly punctured, its centre without the usual covering of hair, but together with all the other segments sparingly fringed near the lower edge with coarse fulvous pubescence; posterior femora extending beyond the elytra for about a fourth their length, strongly incrassate, sub-clavate, outer surface longitudinally convex; their upper edge rounded, its posterior third dilated and compressed into an acute ridge, notched immediately above the extreme apex of the thigh; lower edge armed near its apex with a stout trigonate tooth; inner surface concave, its anterior half covered with a large patch of coarse fulvous hairs; posterior tibiæ arcuate at the base, their middle portion flexuous, the apex sub-uncinate, the outer edge below the middle armed with a stout spine.—*Male.*

Hab. White Nile. A single specimen in my own collection.

I have named this beautiful species after my friend S. Stevens, Esq. It is nearly allied to *S. Senegalensis*, but nearly twice the size, longer and more parallel than that insect, less narrowed behind, rather less convex, its surface sub-opaque; upper edge of the hinder thighs more compressed and dilated at the apex; thorax much broader.

Sagra Jansoni, n. sp.

Elongata, rufo-aurea, viridi-nitens, antennis robustis, dimidio corporis longioribus, purpureis, basi viridibus; thorace subremote punctato, latitudine paullo longiori, angulis anticis sub-prominulis, obtusis; elytris intra humeros oblique sulcatis, infra basin leviter transversim-impressis, punctato-striatis, interspatiis tenuiter reticulato-vermiculatis; femoribus intermediis subtus in dentem compressum productis.

Long. mas. 6—7 lin.; fem. $5\frac{1}{3}$ lin.

Mas.—Femoribus posticis elytra modice superantibus, elongato-obovatis, intus ad basin flavo-tomentosis, subtus ante apicem bidentatis; tibiis ejusdem paris apice mucronatis, ante apicem extus spinâ validâ intus dente brevi armatis, abdominis segmento primo longitudinaliter excavato, crebre punctato, flavo-tomentoso.

Fœm.—Femoribus posticis elytra vix superantibus, ante apicem cretâ denticulatâ instructis.

Var. A.—Metallico-viridis, subtus purpureo-micans; antennis purpureis.

Elongate, shining rufo-aureous, with metallic-green markings and reflexions beneath; antennæ purple, their basal half metallic-green. Head deeply punctured; antennæ robust, slightly incrassate towards their apex, two-thirds the length of the body in the *male*, somewhat shorter in the *female*, six basal joints metallic-green, the remainder deep purple. Thorax slightly longer than broad, anterior margin moderately produced, anterior angles moderately prominent; sides slightly concave; above deeply but not very closely punctured, middle transversely depressed in front of the basal margin. Scutellum metallic-green, its surface smooth, impunctate. Elytra oblong-elongate, their apex sub-acutely rounded, above convex, base obliquely impressed within the shoulders, the latter slightly prominent, basilar space bounded below by a shallow but distinct transverse depression; finely but distinctly punctate-striate, the puncturing being visible over the whole surface of the elytra, interspaces finely vermiculate-reticulate. Body beneath more stained with metallic-green, sub-remotely punctured; four anterior thighs moderately incrassate, the intermediate pair produced beneath into a flattened tooth; tibiæ strongly curved.

Male.—Intermediate thighs produced beneath into a flattened acute tooth; hinder thighs extending beyond the elytra for a fourth their length; elongate-obovate, incrassate, their lower edge notched at the apex and armed with two short stout teeth, of

which the anterior one is rather larger; on the inner surface, at the base, is a large patch of coarse yellow pubescence; tibiæ of the same pair mucronate at the apex, and armed just before the latter, externally with a stout spine, internally with a very short obtuse tooth; basal segment of abdomen longitudinally excavated, coarsely punctured and covered with coarse yellow pubescence.

Female.—Intermediate femora produced beneath into a flattened sub-acute tooth; hinder thighs scarcely extending beyond the elytra, furnished near their apex beneath with a short denticulate ridge.

Var. A.—Bright metallic-green, body beneath and legs with purple reflexions.

Madras, collected by Mrs. Hamilton.

I have named this beautiful species after my friend E. Janson, Esq., the able co-secretary of our Society; it ought to stand close to *S. Petelii*, but is easily separated from that insect by its elongate form and by the toothed intermediate thighs.

Sagra carbunculus, Hope.

"Cyanea, elytris igneo auroque micantibus, pedibus posticis incrassatis, tibiis incurvatis."

Long. $4\frac{1}{2}$ lin.

"Caput, antennæ, thorax, corpus infra pedesque cyanei. Thorax fere quadratus, antice ante oculos contractus, punctulatus. Elytra carbunculosa, igneo auroque micantia, creberrime punctulata. Pedes femoribus 4 anticis parum incrassatis, tibiis subincurvis; posticis valde incrassatis, subunidentatis, tibiis arcuatis, tarsis flavo-spongiosis.

"Ex. India orientali, Sylhet."

Hope, Trans. Lin. Soc. xix. p. 112, pl. 10, fig. 9; Annals and Mag. of Nat. Hist. ix. p. 248.

Mas.—Femoribus posticis valde incrassatis, elytra sat superantibus, intus prope marginem inferiorem flavo-tomentosis; subtus ante apicem laminâ tridentatâ, dente intermedio valido, postice denticulato, instructis; tibiis ejusdem paris basi arcuatis, deinde subrectis, apice mucronatis, extus ante apicem late emarginatis, intus obsoletius dentatis, abdominis segmento primo complanato, leviter excavato, parce punctato, vage flavo-tomentoso.

Var. A.—Duplo minor, femoribus posticis elytra modice superantibus, glabris, subtus ante apicem cristâ tridentatâ instructis, tibiis ejusdem paris simplicibus.

Long. 6 lin.; *var.* $4\frac{3}{4}$ lin.

Male.—Posterior pair of thighs considerably longer than the elytra, strongly incrassate, their inner surface furnished near its lower border with a narrow stripe of fulvous pubescence; lower edge denticulate, produced near the apex into a flattened tridentate plate, the middle tooth of which is elongate, slightly curved and denticulate on its posterior margin; upper surface indistinctly carinate; tibiæ of the same pair arcuate at their base, thence nearly straight to their apex, the latter mucronate; inner surface on its outer edge, immediately before the apex, deeply emarginate, the inner edge obsoletely tuberculate; basal segment of abdomen flattened, indistinctly excavated, remotely punctured, sparingly clothed with short fulvous hairs.

Var. A. Nearly one-half smaller, hinder thighs extending for a short distance beyond the apex of the elytra, glabrous within, their lower edge denticulate and produced just before the apex into a short tridentate ridge, the two outer teeth of which are small and indistinct; posterior tibiæ arcuate, simple, their apex mucronate.

This insect varies in the degree of punctation and also in the coloration of the elytra; the interspaces are minutely punctured and sub-granulose, and covered with distinct irregular sinuosities, which become more crowded near the apex of the elytra, their interstices on that portion being irregularly wrinkled; in the var. A. the elytra are smoother, and the colour of the elytra for the most part is rufo-aureous, with a violet tint, narrowly edged with bright metallic blue; in my specimen of var. A. the elytra are bright igneous, bordered with metallic blue.

Hab. Northern India, Sylhet.

This beautiful little species, unknown to Lacordaire, is now not uncommon in our collections; a single specimen of var. A. is in my own cabinet.

Sagra lucida, n. sp.

Oblongo-elongata, læte purpurea, nitida; antennis robustis, corporis dimidio vix longioribus; thorace latitudine paullo longiori, sub-cylindrico, margine antico modice producto, angulis anticis vix prominulis; elytris oblongis, intra humeros modice impressis, basi paullo elevatis, infra basin leviter transversim depressis; tenuiter punctato-striatis, striis sub lente ægre distinguentibus.

Fœm.—Femoribus posticis elytra non superantibus, subtus ante apicem cristâ brevi denticulatâ instructis; tibiis ejusdem paris simplicibus.

Long. 6 lin.

Oblong-elongate, deep shining metallic-purple. Head impressed

on the forehead with a deep round fovea; antennæ robust, thickened towards their apex, scarcely longer than half the body, last four joints black, opaque. Thorax rather longer than broad, sub-cylindrical, anterior margin moderately produced, anterior angles scarcely prominent; above shining, impunctate. Scutellum transverse-quadrate, its apex obtuse. Elytra oblong, moderately impressed within the shoulders, the latter sub-prominent; basilar space indistinctly elevated, bounded beneath by a shallow transverse depression; smooth and shining, very finely punctate-striate, the striæ, which are visible only under a lens, placed at regular intervals on the surface.

Female.—Posterior pair of thighs not extending beyond the elytra, their lower edge furnished just before the apex with a short denticulate ridge; posterior tibiæ simple.

Hab. Cape Coast.

Collection of Major Parry; also in my own cabinet.

This beautiful insect belongs, through the elevated basilar space of its elytra, to the first division of the genus; its male probably resembles that of *S. Senegalensis*.

Sagra emarginata, n. sp.

Elongata, cuprea, læte rufo-cuprea, purpureo-micans; antennis extrorsum purpureis, subtus nitida, supra sub-opaca; thorace sub-cylindrico, latitudine paullo longiori, angulis anticis vix prominulis; elytris sub-parallelis, apicem versus attenuatis, singulatim apice leviter emarginatis, supra intra humeros impressis, tenuiter punctato-striatis, striis per paria vix approximatis.

Mas.—Femoribus posticis elytra parum superantibus, subtus ante apicem cretâ brevi basi dente parvo munitâ instructis, tibiis ejusdem paris curvatis, apice vix mucronatis; abdominis segmento primo longitudinaliter excavato, sub-crebre punctato, laxe flavo-tomentoso.

Fœm.—Femoribus posticis elytris non superantibus, glabris, subtus ante apicem cretâ brevi basi dente parvo munitâ instructis, tibiis posticis curvatis.

Long. *mas* 5—6 lin.; *fœm.* 8 lin.

Elongate, cupreous or rufo-cupreous, with purple reflexions; body beneath shining, above sub-opaque, six terminal joints of antennæ dark purple. Head sub-remotely punctured, front impressed with a longitudinal fovea; antennæ robust, more than half the length of the body. Thorax sub-cylindrical, rather longer

than broad; anterior margin moderately produced, anterior angles scarcely prominent; surface impunctate, impressed at the base with an indistinct fovea. Scutellum longitudinally grooved. Elytra narrowly oblong, sub-parallel, narrowed near the apex, the latter in each elytron slightly but distinctly sinuate; upper surface deeply impressed at the base within the shoulders, finely and regularly punctate-striate, the striæ distinct for their whole length, and (excepting at the extreme base, where they slightly approximate in pairs) equidistant.

Male.—Posterior femora slightly produced beyond the apex of the elytra, glabrous at the base, incrassate, somewhat flask-shaped, their lower edge obsoletely denticulate, furnished before the apex with a short denticulate ridge; tibiæ of the same pair arcuate, simple, their apex obtusely mucronate; basal segment of abdomen with a longitudinal shallow depression, the surface of which is deeply but not very closely punctured, and sparingly covered with very fine fulvous hairs.

Female.—Posterior pair of thighs not extending beyond the elytra, their lower edge similar to that of the *male*.

Hab. west coast of Africa.

Both sexes in the collection of Major Parry; the *male* in my own cabinet.

Sagra Parryi, n. sp.

Elongata, rufo-purpurea, sub-nitida, subtus nitida; antennis extrorsum cæruleis, tarsis obscure purpureis; thorace latitudine sat longiori, sub-cylindrico, angulis anticis vix prominulis; elytris tenuiter punctato-striatis, striis fere æquidistantibus.

Mas.—Femoribus posticis elytra paullo superantibus, intus ad basin flavo-tomentosis, subtus pone medium cristâ brevi postice valide unidentatâ et ante apicem dente brevi obtuso, instructis; tibiis ejusdem paris apicem versus incrassatis, apice obtuse mucronato, margine antico extus cristâ, a vix ante medium ad paullum ante apicem prolongatâ, et apice in dentem compressum productâ, intus ante apicem cristâ brevi emarginatâ instructo; abdominis segmento primo leviter excavato, sub-crebre punctato, vix flavo-tomentoso.

Fœm.—Femoribus posticis elytris non longioribus, subtus ante apicem cristâ brevi denticulatâ instructis, tibiis ejusdem paris curvatis; thorace minus elongato.

Long. 7—8 lin.

Elongate, reddish purple or purple, sub-nitidous above, shining beneath. Head deeply punctured; antennæ robust, longer than

half the body, five terminal joints deep metallic-blue. Thorax considerably longer than broad, nearly resembling, in that respect, *S. longicollis*, Lac., sub-cylindrical, apical margin very slightly produced, anterior angles obsoletely prominent; upper surface impunctate, impressed at the base with a shallow but distinct longitudinal fovea. Scutellum impressed with a broad longitudinal fovea. Elytra oblong-elongate, sides sub-parallel, narrowed towards the apex; above sub-nitidous, moderately impressed within the shoulders, the latter slightly prominent; surface finely punctate-striate, the striæ æquidistant, slightly approximating in pairs at the base, interspaces finely vermiculate; in the *female* the surface of the outer disc is very feebly concave below the shoulders. Body beneath shining, tarsi obscure purple, with occasionally a rufous reflexion.

Male.—Posterior thighs slightly exceeding the elytra in length, strongly incrassate; lower edge armed before the apex with a very short obtuse tooth, and immediately behind the middle with a short ridge, the posterior extremity of which is produced into a long stout tooth, inner surface furnished near the base with a small patch of fulvous hairs; tibiæ of the same pair compressed, strongly curved at the base, gradually thickened from immediately before the middle nearly to the apex, the latter mucronate; anterior surface deeply channelled, its outer edge furnished with a broad ridge, which, commencing just before the middle, gradually increases in width until just before reaching the apex of the tibia, terminating in a broad flattened tooth; the inner edge is furnished immediately before its apex with a short emarginate ridge; basal segment of abdomen longitudinally excavated, irregularly but somewhat closely punctured, its surface very sparingly covered with short fulvous hairs, which are only visible when viewed obliquely.

Female.—Posterior pair of thighs not extending beyond the apex of the elytra, the lower edge denticulate, and produced near its apex into a short denticulate ridge.

Hab. west coast of Africa.

Collections of the British Museum, Major Parry, and my own.

This beautiful species is remarkable for the peculiar form of the hinder tibiæ; it is closely allied to *S. amethystina*, Lac., but differs in having a tomentose patch at the inner base of the posterior femora; *S. Lacordairei*, Thoms, appears to come very near to the present insect, but according to the short description of the author, the dentation of the thighs, and also the form of the tibiæ, differ from the present insect.

Sagra bicolor, Lacordaire.

" Elongata, nigro-cyanea (vel nigra), opaca; elytris purpureis opacis, subtilissime punctato-striatis, striis per paria aliquantum approximatis." Lacord. Monog. des Phyt. tom. i. p. 55.

Mas.—Femoribus posticis elytra valde superantibus, intus ad basin flavo-tomentosis, subtus ante apicem bidentatis, dente exteriori valido; supra a medio ad apicem late canaliculatis; tibiis ejusdem paris basi arcuatis, deinde sub-rectis, apice leviter mucronatis, basi tuberculo, ante apicem dentibus duobus parvis instructis; abdominis segmento primo longitudinaliter vix excavato, crebre punctato, vix tomentoso.

Sagra Natalensis, Thoms. Archiv. tom. i. p. 396.

Long. 7½—9 lin.; *var.* 6 lin.

Var. A.—Minor, femoribus posticis elytra paullo superantibus, subtus ante apicem cristâ brevi bidentatâ, dente postico valido, munitis; tibiis ejusdem paris arcuatis, apice sub-mucronatis, basi tuberculo, ante apicem dente sub-obsoleto instructis; abdominis segmento primo longitudinaliter vix excavato, tenuiter punctato, vage flavo-tomentoso.

Var. B.—Corpus olivaceum, elytris cupreis, cæteris ut in Var. A.

Male.—Hinder pair of thighs elongate incrassate, extending beyond the elytra for about a third of their length, their upper edge deeply channelled along the posterior half; underside armed just before the apex with two teeth, the outer one stout, the inner minute; inner surface hollowed out from the base nearly to the middle, the excavated portion covered with an obovate patch of coarse yellow pubescence; posterior tibiæ curved at the base, their inner edge furnished with a short tubercle, the remainder of their course nearly straight; apex sub-mucronate, and armed just before the extremity with two short ill-defined lateral teeth; longitudinal space on the basal segment of abdomen feebly excavated, somewhat closely punctured, vaguely tomentose.

Var. A.—One-half smaller; thorax rather narrower, posterior thighs slightly longer than the elytra, the outer tooth on the lower edge replaced by a short bidentate ridge, the posterior tooth of which is longer and stouter than the others; inner tooth nearly obsolete; hinder tibiæ regularly curved, their inner surface tuberculate at the base, and furnished near the apex with an indistinct tooth, apex itself feebly mucronate.

Var. B. *Male*.—Olivaceous, the elytra cupreous, more or less stained with metallic-green; all the other characters as in var. A.

Hab. Port Natal.

In most collections; var. A. in the British Museum; var. B. in my own cabinet.

This insect has latterly arrived in some abundance from the above locality; the *male* may be known from all its allies by the broad groove on the posterior half of the upper edge of the hinder thighs; its coloration is also entirely different from any known species. I look upon var. A. and B. as bearing the same relation to the normal state of the species that *S. perlucida* and *ignita* do to their respective types. The tomentose space on the hinder thigh in the male will cause the removal of the species from the sub-section in which Lacordaire, from being unacquainted with this sex, has provisionally placed it, to the succeeding one. Mr. Thomson has described the male of this species under the name of *Sagra Natalensis*.

Sagra Kirbyi, n. sp.

Elongata, obscure olivacea, sub-opaca; thorace subc-ylindrico, margine antico sat producto, angulis anticis vix prominulis; elytris regulariter punctato-striatis, striis per paria sat approximatis, interspatiis punctatis, processu prosternali obsoleto.

Mas.—Femoribus intermediis subtus acute unidentatis, posticis elytra valde superantibus, supra anguste canaliculatis, intus ad basin flavo-tomentosis, subtus ante apicem cristâ denticulatâ, antice dente valido munitâ, instructis; tibiis ejusdem paris basi arcuatis, deinde sub-rectis, apice mucronatis, basi tuberculo, ante apicem dentibus duobus indistinctis, munitis; abdominis segmento primo medio longitudinaliter complanato, sub-remote punctato, vage flavo-tomentoso.

Fœm.—Femoribus intermediis subtus obtuse unidentatis, posticis elytris non superantibus, subtus cristâ denticulatâ paullo ante apicem dente brevi munitâ, instructis; tibiis ejusdem paris arcuatis, basi tuberculatis, apice sub-mucronatis.

Long. *mas* 8½, *fœm*. 7 lin.

Elongate, obscure olivaceous, sub-opaque. Head minutely punctured; the antennæ unfortunately wanting in the only male specimen that I possess; in the female they are robust and more than half the length of the body. Thorax sub-cylindrical, rather longer than broad, anterior edge moderately produced, anterior angles indistinctly prominent, surface sub-remotely impressed with

very minute punctures, which are only visible under a lens. Scutellum dark shining metallic-green, longitudinally grooved. Elytra sub-elongate, narrowed behind, their surface impressed within the shoulders, distinctly punctate-striate, the striæ closely approximating in pairs, intervals between the double rows remotely impressed with rather less distinct punctures than those on the striæ themselves; these punctures are wanting in the single female before me. Prosternal process obsolete.

Male.—Intermediate thighs produced beneath into a compressed acute tooth, posterior pair extending for a third of their length beyond the apex of the elytra, incrassate and resembling an elongate club, the upper edge narrowly but distinctly grooved along the posterior two-thirds of its length; outer edge of the groove elevated, and forming (when viewed from within) a distinct ridge, inner surface excavated at the base, and clothed with coarse fulvous pubescence; lower edge indistinctly denticulate, furnished before the apex with a short ridge, the apex of which is produced into a stout conical tooth, in front of which is a deep notch; tibiæ of the same pair curved at the base, nearly straight towards the mucronate apex, furnished on either side just before the latter with a nearly obsolete obtuse tooth; inner surface tuberculate at the base; basal segment of abdomen longitudinally depressed, deeply but sub-remotely punctured, clothed with a few coarse fulvous hairs.

Female.—Intermediate thighs armed beneath with an obtuse tooth, posterior pair scarcely extending beyond the apex of the elytra, their lower edge obsoletely denticulate, furnished before the apex with a short denticulate ridge, the anterior extremity of which is produced into a short tooth.

Hab. Congo.

The *male* in my own collection, without precise locality, formerly belonged to the Rev. W. Kirby, and was sent to him by M. Du Freme. The *female*, from Congo, is in the British Museum. It ought to stand near *S. bicolor*, and it forms a link between the section in which I have placed it and the succeeding one; in the absence of a prosternal process and in the punctation of the elytra it agrees with the former, whilst on the other hand the toothed intermediate thighs ally it to the latter group.

Sagra Murrayi, n. sp.

Late elongata, postice attenuata, cæruleo-viridis, sub-nitida; antennis corporis dimidio longioribus, thorace sub-quadrato,

angulis anticis prominulis; elytris fortiter flexuoso-impressis, interspatiis (præsertim ad basin) elevato-plicatis; processu prosternali compresso, retrorsum producto, femoribus intermediis subtus unidentatis.

Mas.—Femoribus intermediis subtus valide unidentatis, posticis elongatis rectis, supra sub-sinuatis, intus ad basin flavo-tomentosis, subtus ante apicem bidentatis, dente externo valido interno minuto; tibiis ejusdem paris sub-rectis basi tuberculatis, ante apicem sub-flexuosis, apice mucronatis; abdominis segmento primo longitudinaliter excavato, fortiter punctato, flavo-tomentoso.

Fœm.—Femoribus intermediis obtuse dentatis, posticis elytra non superantibus, subtus cristâ denticulatâ antice unidentatâ instructis; tibiis ejusdem paris arcuatis, basi tuberculatis.

Long. *mas* $9\frac{1}{2}$, *fœm.* $8\frac{2}{3}$ lin.

Broadly elongate, narrowed posteriorly, dark metallic blue-green, sub-nitidous. Head impressed on the neck with an oblong fovea; antennæ robust, longer than half the body. Thorax sub-quadrate, broader than in *S. tristis*, anterior margin moderately produced, feebly sinuate in the middle, anterior angles moderately prominent, above sub-opaque, impunctate, impressed at the base with a distinct sub-cruciform fovea. Scutellum ovate, longitudinally bifoveolate. Elytra elongate-ovate, truncate at their base, narrowed behind their middle; sub-nitidous, slightly impressed within the shoulders; surface closely covered with irregular grooved lines, their interspaces strongly elevated, rugoso-plicate; these rugosities are less distinctly raised below the middle of the elytra, and become nearly obsolete towards the apex, although even there much more visible than in *S. tristis;* prosternal process flattened, produced posteriorly to the mesosternum.

Male.—Intermediate pair of thighs incrassate, their lower surface produced into a stout acute tooth; hinder thighs extending beyond the elytra for nearly a third of their length, elongate, incrassate, not increasing in width below the middle, lower edge furnished with a narrow denticulate ridge; apex notched and bidentate, the outer tooth large and stout, the inner one minute, inner surface furnished at the base with a yellow tomentose patch; hinder tibiæ nearly straight, slightly flexuous before the apex, the latter obtusely mucronate, their inner surface tuberculate at the base; basal segment of abdomen longitudinally excavated, closely punctured, flavo-tomentose.

Female.—Intermediate thighs produced beneath into an obtuse tooth; hinder pair armed on the lower edge with a stout acute sub-apical tooth, hinder tibiæ arcuate, their inner surface tuberculate at the base, the apex simple. In this sex there are indications of some deeply punctured striæ on the elytra; they are, however, much interrupted by the rugosities of the surface, and are with difficulty to be made out.

Hab. White Nile. Both sexes in my own cabinet.

Very close to *S. tristis*, immediately after which insect it must be placed; it differs in the broader thorax, the much more strongly marked rugosities on the surface of the elytra, and in the different shape of the posterior femora; these latter are much longer, scarcely increasing in thickness from below their base nearly to the apex, their upper edge being much straighter and obsoletely sinuate in the middle.

Sagra Döhrnii, n. sp.

Elongato-oblonga, læte purpurea, nitida; antennis corporis dimidio paullo longioribus; thorace sub-quadrato, margine antico modice producto, angulis anticis sat productis, retrorsum fere curvatis, margine antico arcuatis, elytris fortiter vermiculatis, interspatiis (præsertim ante medium) valde elevatis, plicato-rugosis.

Fœm.—Femoribus intermediis subtus acute unidentatis, posticis subtus denticulatis, ante apicem cristâ brevi antice unidentatâ instructis; tibiis ejusdem paris arcuatis, apice vix mucronatis, processu prosternali compresso, retrorsum producto.

Long. 8 lin.

Narrowly oblong, bright purple, nitidous. Head finely punctured, front impressed with a quadrilobate fovea; antennæ robust, rather longer than half the body. Thorax sub-quadrate, apical margin moderately produced, anterior angles very prominent, their front edge convex, the hinder one concave, causing the angles themselves to appear almost recurved; upper surface shining, impunctate, impressed near the base with a shallow fovea. Elytra rather more parallel and less narrowed behind than in *Sagra Murrayi*, otherwise agreeing in form and sculpture with that species, their surface still more irregular, the punctate striæ more deeply impressed, coarse, and rather more visible to the eye.

Female.—Intermediate thighs armed beneath with an acute tooth; posterior pair not exceeding the elytra in length, their lower edge denticulate, produced before the apex into a short

indistinct ridge, the anterior edge of which is unidentate; posterior tibiæ arcuate, the apex obsoletely mucronate.

Hab. West Coast of Africa. In Major Parry's and my own collections.

At once separated from *S. Murrayi*, next to which species it ought to stand, by the peculiar form of the anterior angles of the thorax, and the acutely dentate mesofemora.

Genus Cheiloxena. (Details, Pl. XIV.)

Antennæ paullum intra marginem interiorem oculorum insertæ, filiformes, robustæ, articulo primo brevi, incrassato, secundo brevissimo, tertio elongato, cæteris fere æqualibus.

Mandibulæ (fig. *b*) prominentes, robustæ, apice bidentatæ, dextrâ intus dentatâ.

Labrum (fig. *e*) transversum, antice sub-sinuatum.

Epistoma (fig. *c*) facie separata, hujus margine inferiori (fig. *d*) fere occultato, apice membranacea.

Palpi (figs. *f*, *g*) articulo ultimo obovato, apice truncato.

Mentum (fig. *g*) transversum, concavum.

Labium (fig. *g*) corneum, obtusum.

Prosternum distinctum, postice ampliatum.

Caput (fig. *a*) perpendiculare, faciei margine inferiori valde emarginatâ, oculis rotundato-ovatis, intus vix sinuatis.

Thorax (fig. *e*) sub-cylindricus, basi et apice paullo angustatus, lateribus dentatis.

Scutellum sub-trigonatum, apice obtusum.

Elytra thorace multo latiora, oblonga, parallela, apice rotundata, convexa, humeris lateralibus prominulis.

Pedes modice robusti, mediocres; coxis quatuor anticis subconicis, femoribus vix incrassatis, inermibus, posticis (fig. *j*) cæteris non crassioribus; tarsis (fig. *h*) articulis sub-trigonatis, inter se latitudine æqualibus, tertio apice leviter emarginato, ungue hoc duplo longiori, unguiculis dente brevi armatis.

Abdomen (fig. *k*) segmentis intermediis angustatis.

Corpus elongato-oblongum, convexum.

Type *Cheiloxena Westwoodii*, Baly.

This singular genus is remarkable for the possession of a free *epistoma*, being separated by this peculiarity from the other known phytophagous genera, in all of which the same part is closely united in a single piece with the face. In *Cheiloxena* the *epistoma* is attached by its base to the inner surface of the head, being more or less concealed (when viewed from above) by the

deeply emarginate lower edge of the face; the extent of surface visible varies greatly in different individuals, rendering it more than probable that the insect in life has the power of retracting to a certain degree the part within the head. The anterior edge is bordered by a broad membranous margin. *Cheiloxena* has very strong affinities with the *Longicornia;* in fact, in many genera amongst the *Lamiciдæ* (the family to which it is most nearly related) a similar structure of the *epistoma* exists. It is, however, at once separated from that group, as well as from the majority of the tribe, by its simple eyes; whilst the perpendicular head and the absence of a neck forbid its being placed with the *Lepturidæ,* the only longicorn family possessing a similar form of eye. I have not therefore hesitated in uniting it with the *Phytophaga,* of which great tribe it will probably ultimately form a distinct family; for the present I have placed the genus with the *Sagridæ,* with which family it appears to have most characters in common. It agrees with it in having a narrow thorax and a distinct prosternum, differing in the free epistoma, non-incrassate and unarmed hinder thighs, and (*Amatella* excepted) in the toothed claws. From the *Donaciдæ* and *Crioceridæ* it is separated by the distinct prosternum; from the *Chrysomelidæ* by the narrow thorax and smaller third joint of the tarsi; and from the *Eumolpidæ* by this latter character and the different form of the antero-lateral plate of the antipectus; it also differs from all the previously mentioned groups, approaching the *Clythridæ* and allied families, in the contraction of the intermediate abdominal segments.

Cheiloxena Westwoodii, n. sp. (Pl. XIV. figs. 1, 2.)

Sub-elongata, convexa, opaca, fusca, pilis squamæformibus adpressis obscure flavis (his hic illic in elytris in maculas parvas condensatis), induta, capite thoraceque fortiter et crebre punctatis, hoc sub-cylindrico, lateribus ante medium dentato; elytris fortiter sub-crebre striato-punctatis, utrisque sereibus quatuor tuberculorum elevatorum instructis.

Long. 4—5$\frac{1}{3}$ lin.

Sub-elongate, convex, opaque, obscure fuscous, whole body covered with short adpressed scale-like hairs, which are congregated here and on the surface of the elytra into small obscure fulvous patches. Head coarsely and closely punctured; face vertical, somewhat wedge-shaped, its inferior margin deeply notched; eyes prominent, rotundate-ovate, their inner edge feebly sinuate; antennæ robust, nearly three-fourths the length

of the body, their surface covered with long adpressed pubescence, finer than that on the body. Thorax rather longer than broad, sub-cylindrical, sides rounded, obliquely narrowed from the middle to the base, narrowed in front, armed before the middle with three or four stout obtuse teeth, placed in an oblique row; anterior margin slightly produced, convex; surface closely and coarsely punctured, almost entirely covered with four or five large shallow excavations. Scutellum sub-trigonate, sinuate on the sides, the apex rounded, surface closely covered with adpressed hairs. Elytra considerably broader than the thorax; sides parallel, apex regularly rounded; above convex, transversely depressed below the basilar space, shoulders laterally prominent, their apex rounded and compressed, its edge indistinctly sinuate; surface somewhat closely covered with large round deeply impressed punctures, longitudinally arranged in striæ; on each elytra are four rows of elevated oblong tubercles, the inner one most distinct, the others only visible on the hinder half of the surface. Under part of body sub-opaque, abdomen less closely punctured; hinder pair of thighs not extending to the apex of the elytra, and not thicker than the rest.

Hab. Sydney. Collected by Mr. Hunter.

TABULAR LIST OF THE SPECIES OF SAGRA.

Divisio I. Elytra basi elevata, infra basin transversim depressa.

I. *Femoribus posticis* ‡ *maris intus ad basin glabris; subtus apice emarginatis, tibiis posticis apice tridentatis.*

* *Femoribus posticis subtus tridentatis.*

Sp. 1. *Buquetii*, Lesson.

Var. A (*mas*). Minor; tibiis posticis simplicibus, apice breviter mucronatis.

Sagra perlucida, Lacord.

** *Femoribus posticis subtus bidentatis, dente postico in medio emarginationis posito.*

Sp. 2. *nigrita*, Oliv.

Var. A (*mas*). Femoribus posticis subtus tridentatis; tibiis ejusdem paris simplicibus, apice leviter mucronatis, intus ante apicem interdum obsolete unidentatis.

‡ In the following Table the characters are drawn, unless otherwise stated, from the normal forms of the fully developed males of the various species.

Var. B. Corpus obscure æneum, cæteris ut in typo.
Sagra dentipes, Fab.?

Sp. 3. † *dentipes*, Fab.

Sp. 4. † *empyrea*, Lacord.

Sp. 5. *Druryi*, Lacord.

Var. A (*mas*). Minor; femoribus posticis elytra vix superantibus, subtus tridentatis, tibiis ejusdem paris simplicibus, apice leviter mucronatis, intus ante apicem interdum obsolete unidentatis.
Sagra tridentata, Weber.

Var. B (*mas*). Femoribus posticis subtus bidentatis, cæteris ut in var. A.
Sagra Weberi, Lacord.

Sp. 6. † *chrysochlora*, Lacord.

Sp. 7. *longicollis*, Lacord.

Sp. 8. *splendida*, Weber.

Var. A (*mas*). Femoribus posticis elytris vix longioribus.

Var. B (*mas*). Minor; femoribus posticis elytris vix longioribus, subtus tridentatis; tibiis ejusdem paris simplicibus, apice leviter mucronatis, intus ante apicem rarius obsolete unidentatis.
Sagra ignita, Lacord.
Sagra formosa, Lacord.

Sp. 9. *speciosa*, Lacord.

Var. A (*mas.*). Minor; pedibus posticis ut in *S. splendida*, var. B.

*** *Femoribus posticis subtus bidentatis, dente postico ad angulum posticum emarginationis posito.*

Sp. 10. *Pfeifferi*, Baly.

**** *Femoribus posticis subtus unidentatis, dente ante angulum anticum emarginationis posito.*

Sp. 11. *superba*, Lacord.

Var. A (*mas*). Minor; femoribus posticis elytra modice superantibus, subtus unidentatis; tibiis posticis simplicibus, apice breviter mucronatis.
† *Sagra Fabricii*, Lacord.

Sp. 12. *quadraticollis*, Lacord.

II. *Femoribus posticis intus flavo-tomentosis.*

* *Tibiis posticis (maris) tridentatis, dente exteriori valido plerumque in spinam curvatam producto, dente interiori minuto, sæpe obsoleto.*

a *Mesosterno apice obtuso.*

Sp. 13. *Javeti*, Baly.

Sp. 14. *Senegalensis* (Dej.), Klug.

Sp. 15. *Stevensi*, Baly.

Sp. 16. *Jansoni*, Baly.

b *Mesosterno apice truncato.*

Sp. 17. *Petelii*, Buq.

Var. A (*mas*). Minor; femoribus posticis intus glabris, tibiis ejusdem paris simplicibus.

Sagra pygmæa, Lacord.

** *Tibiis posticis apice mucronatis, extus ante apicem late emarginatis, intus obsolete tuberculatis.*

Sp. 18. *carbunculus*, Hope.

Var. A (*mas*). Minor; tibiis posticis apice breviter mucronatis, simplicibus.

Species ad hoc divisionem pertinentes, sed incertæ sedis.

Sp. 19. *heterodera*, Lacord.

Sp. 20. *lucida*, Baly.

Divisio II. Elytra basi non elevata, infra basin non aut vix transversim depressa; corpus oblongo-elongatum aut elongatum.

I. *Processu prosternali nullo.*

* *Femoribus intermediis inermibus.*

a *Femoribus posticis intus glabris.*

Sp. 21. † *amethystina* (Dej.), Guér.

Sp. 22. *emarginata*, Baly.

aa *Femoribus posticis intus flavo-tomentosis.*

Sp. 23. *Parryi*, Baly.

Sp. 24. *bicolor*, Lacord.

Var. A. (*mas*). Minor; femoribus posticis subtus ante apicem cristâ basi bidentatâ instructis.

Sp. 25. † *cæruleata*, Lacord.

Sp. 26. † *Urania*, Lacord.

Sp. 27. *seraphica*, Lacord.

Sp. 28. † *Adonis*, Lacord.

** *Femoribus intermediis subtus unidentatis.*

Sp. 29. *Kirbyi*, Baly.

II. *Processu prosternali postice producto.*

* *Thoracis angulis anticis paullo prominulis, femoribus intermediis* fœminæ *obtuse unidentatis.*

Sp. 30. *tristis*, Fabr.

Sp. 31. *Murrayi*, Baly.

** *Thoracis angulis anticis sat prominulis; femoribus intermediis* fœminæ *subtus acute unidentatis.*

Sp. 32. *Döhrnii*, Baly.

Sp. 33. † *Galinieri*, Reiche.

Species mihi ignotæ.

Sp. 34. † *Deyrollii*, Thoms.

Sp. 35. † *Signoreti*, Thoms.

Sp. 36. † *Lacordairei*, Thoms.‡

Sp. 37. † *ænea*, Oliv.

Sp. 38. † *cyanea*, Dalm.

‡ This insect is probably my *S. Parryi*, but Mr. Thomson's description of the hinder thigh is too brief and superficial to enable me to decide with any approach to certainty.

EXPLANATION OF PLATE XIV.

Fig. 1. *Cheiloxena Westwoodii.*

2. *Cheiloxena Westwoodii*, lateral view.
   - *a*, head of ditto.
   - *b*, mandibles of ditto.
   - *c*, epistoma of ditto, detached from the head.
   - *d*, lower portion of face of ditto, showing the concave notch below which the epistoma is seen.
   - *e*, labrum and epistoma as seen *in sitû* when viewed from above; upper portion corneous epistoma, intermediate ditto the broad membranaceous border, lower ditto the labrum.
   - *f*, maxilla of ditto, with maxillary palpus.
   - *g*, labium of ditto and labial palpi.
   - *h*, tarsus of ditto.
   - *i*, hinder leg of ditto.
   - *k*, abdomen of ditto.

3. Hinder thigh of *Sagra Javeti*, ♂, upper surface.
4. Hinder thigh of *Sagra Pfeifferi*, ♂.
5. Hinder thigh and tibia of *Sagra Parryi*, ♂.
6. Hinder thigh and tibia of *Sagra carbunculus*, ♂.
7. Hinder thigh of *Sagra bicolor*, ♂.
8. *Intermediate thigh of *Sagra Jansoni*, ♂.
8. Thorax of *Sagra Döhrnii*.
9. Hinder thigh of *Sagra Döhrnii*, ♀.
9. *Intermediate thigh of *Sagra Döhrnii*, ♀.
10. Hinder thigh of *Sagra Stevensi*, ♂.
11. Hinder thigh of *Sagra splendida*, var. B. ♂.
12. Hinder thigh of *Sagra tristis*, ♂.
13. Hinder thigh of *Sagra Murrayi*, ♂.

XXII. *On the Genus* Erateina, *Doubl.; with Descriptions of some new Species.* By W. Wilson Saunders, Esq., F.R.S., &c.

[Read May 7th, 1860.]

The genus *Erateina* was established by the late talented Lepidopterist Edward Doubleday, in a paper read before the Entomological Society, and subsequently published in the 5th volume of the Society's Transactions. It was formed to include certain very interesting moths of the family *Geometridæ*, natives of the mountain regions of tropical America, the males of some of the species being very remarkable for a curious fold of the inner margin of the posterior wings, the use of which still remains an enigma unsolved. E. Doubleday described five species, which are well figured in the volume of Transactions before referred to, and these he divided into three sections, according to the amount of prolongation of the posterior wings into a tail-like process, which gives a very peculiar appearance to some of the species. Since the publication of E. Doubleday's paper, little has been done to increase our knowledge of this genus, the only additions to it being made by Mons. Herrich-Schæffer and Mons. Guenée, the former describing one new species in his "Lepidopterorum Exoticorum," Nos. 75 and 76, under the name of *radiaria*, belonging to Doubleday's 3rd section, and the latter author, in the "Suites à Buffon—Lépidoptères," vol. 10, another new species, belonging to the same section, and to which he gives the name of *siliquata*. He also raises Doubleday's variety of *Ianthe* with red bands on the anterior wings to the place of a species, calling it *Iphisata*, by the use of an affix to *Iphis*, the name suggested by Doubleday for this remarkable variety. This brings up the number of species to eight, and I have now detected in the rich collection of the British Museum and my own collection six additional species, for which we are indebted to the exertions of recent collectors, and of which descriptions will be found hereafter. These are still derived from the elevated parts of tropical America, and especially from the vicinity of Bogota, which appears to be the head-quarters of the genus. One of the recent discoveries, which I have named *Regina*, is particularly elegant and chaste in its markings and colours, and, at the same time, the largest in size yet brought to our knowledge.

I am doubtful of the necessity of the dividing this genus into sections, otherwise than for the sake of discriminating the species, for the *Neœra* seems to be in form intermediate between the divisions 1 and 3 of E. Doubleday and the new species *lineata*, which, from its peculiar colouring and form, I am unable to include in either of Mr. Doubleday's divisions, and which I make into a fourth division, is again an intermediate form, and must follow the division including *Neœra*.

In the following table will be seen the arrangement which I now propose for the species, with such information regarding their sexes and native countries which I have been able to obtain. From this it will appear that we have positive knowledge of the sexes of two species, that we know the males only of four species, and the females only of eight species. Naturalists who may be in a position to observe these beautiful and interesting insects in their native haunts would do science a good turn by studying the species carefully, and obtaining some of the information so much wanted regarding their transformations, sexes, habits and economy.

ERATEINA.

Section 1.

1. *Zoraida*, Doub. ♂ and ♀ .....Venezuela.
2. *Undulata*, W. W. S. ♂ .....Bogota.
3. *Sinuata*, W. W. S. ♀ .....Bogota.
4. *Ianthe*, Doub. ♀ .....Venezuela.
5. *Iphisata*, Gu. ♀ .....Venezuela.
6. *Julia*, Doub. ♀ .....Venezuela.
7. *Regina*, W. W. S. ♀ .....Bogota.

Section 2.

8. *Neœra*, Doub. ♀ .....Bolivia.

Section 3.

9. *Lineata*, W. W. S. ♀ .....Bogota.

Section 4.

10. *Margarita*, W. W. S. ♂ .....Bogota.
11. *Obscura*, W. W. S. ♂ .....Bogota.
12. *Cynthia*, Doub. ♂ .....Bolivia.
13. *Siliquata*, Gu. ♂ and ♀ .....Brazil.
14. *Radiaria*, H.-Sch. ♀ .....Colombia.

♂ and ♀ of 2 species.
♂ only of 4 species.
♀ only of 8 species.

1. *Erateina undulata*, W. W. S. ♂. (Pl. XV. figs. 1, 1 *a*.)

Head, antennæ and anterior wings above dark umber-brown, the latter with a narrowish white band, crossing a little beyond the centre, abruptly bent inwards about its middle, and not reaching either the anterior or posterior margins of the wing; below red-brown, with redder shades, and a transverse white band as above, but crossing the wing entirely, and a transverse broader ill-defined band about midway between the former and the base of the wing, the space beyond being marked with white lines, and there is also a small white transverse streak between the two white bands. Posterior wings elongated, and produced into an obtuse diverging tail; above black-brown, with a broad crimson nearly straight band, crossing from near the posterior angle of the anterior wing to the inner margin, a little in advance of the base of the tail, and having three crimson elongated spots in the sinuations of the outer margin, and two of the same colour on the inner margin of the tail; below with a narrow crimson band as above, and having the base, fold and portion of the basal side of the crimson band silvery-white, variously lined diagonally with crimson; then a black-brown sinuated band down the tail, corresponding with the dark groundwork of the upperside, and three elongated pinkish-white spots on the outer and three on the inner margin, including the tail. Thorax and body above dark umber-brown. Underside of body and legs white.

Expansion of wings $1\frac{7}{10}$ inch.

Bogota. In the Collection of W. W. Saunders.

This is near *Zoraida* of Doub., but differs in the very undulating and short band of the upperside of the anterior wings, and in having only one narrow band on the underside, and in the broader and less pointed posterior wings.

2. *Erateina sinuata*, W. W. S. ♀. (Pl. XV. figs. 2, 2 *a*.)

Head, antennæ and anterior wings above dark reddish-brown; underside of anterior wings pale reddish-brown, with a silvery-white, nearly straight, rather narrow transverse band, crossing nearly the centre of the wing from margin to margin, and having the basal portion beyond the band all suffused with silvery-white, except an elongate triangular patch of the ground adjoining the band. Posterior wings elongate, produced into a broad abrupt tail; above dark reddish-brown, with a crimson band, having a sinuated margin crossing the wings from the outer angle to the inner margin near the base of the tail, and having the space

beyond the band black-brown, with four crimson spots in the sinuations of the outer margin and a minute crimson spot on the inner margin, just above the termination of the crimson band; below silvery-white at the base, faintly streaked longitudinally with red-brown, beyond which is a crimson band, corresponding with the band on the upperside, which is here reduced to a mere red line, having on its outer margin a series of minute yellow streaks running into the dark reddish-brown ground beyond, on which are three long white spots on the outer margin and two smaller ones of the same colour on the inner margin. Abdomen dark brown above, with the underside and legs white.

Expansion of wings $1\frac{7}{10}$ inch.

In the collection of W. W. Saunders. Bogota.

This is very similar in markings to *Ianthe* of Doub., and chiefly differs in the broad and obtusely pointed posterior wings. I have only seen the female, and in the differences alluded to it is readily distinguished from the female of *Ianthe*.

3. *Erateina Regina*, W. W. S. ♀. (Pl. XV. figs. 3, 3*a*.)

Head, antennæ and thorax dark reddish-brown. Anterior wings above bright rust colour, gradually shaded to dark red-brown at the base, and on the exterior margin, the fringe of which is mottled with black and white; below red-brown, crossed with a rather broad nearly straight silvery white band a little beyond the middle, and an obsolete whitish transverse band between that and the apex, and having the basal portion beyond the silvery band suffused with whitish-grey, all but a broad triangular patch adjoining the band, the apex of which is towards the posterior margin. Posterior wings broad and terminating with a sharply-pointed diverging tail; above with a silver band, crossing the wing in a slanting direction from the middle of the anterior margin to a point on the interior margin about two-thirds its length from the base, the band being crossed with black veins and sinuate anteriorily, and having the basal portion beyond the band black-grey, and the portion in front of the band velvet-like black, margined with red-brown towards the band, and having on the outer margin two silver lunate spots and the tail fringed with the same colour, and two spots, one at the base of the tail, and the other just below the termination of the silver band also silvery-white; below with a broad silver band corresponding with the one on the upper surface, but curved upwards on the inner margin, edged with purplish-crimson, and with the basal portion beyond the band dull

silver, with indistinct crimson longitudinal lines; the outer portion of the wing black-brown, with the marking on the margin as above, and a series of short golden yellow, very fine oblique lines, running from the crimson margin of the band into the black ground. Body above dark-brown, below and legs dull white.

From Bogota. In the British Museum.

Expansion of wings 1-$\frac{9}{10}$ inch.

This is a very distinct species, very unlike any other, is the largest yet described, and, at the same time, the most beautiful in its markings.

4. *Erateina lineata*, W. W. S. ♀. (Pl. XVI. figs. 1, 1 *a*.)

Head black, with the orbits of the eyes white. Thorax dark-brown, with the shoulders red-brown. Anterior wings above black-brown, with a straight transverse yellowish-white band from the middle of the anterior margin to a point a little within the outer margin, near the anal angle, and gradually narrowing as it approaches this point; also having a white narrow line running parallel to and a little within the inner margin; below rich crimson-brown, with a white band, as on the upper side, and another, orange-coloured, nearly midway between that and the outer margin, but much narrower, and crossing from the anterior margin to the inner angle, and having at the base of the wing a series of yellow lines on the nervures. Posterior wings rather broad and slightly produced into a broad rounded tail; above black-brown, with a large orange-red, inverted, lunate patch near the apex, touching the inner margin and extending nearly across the wing, and running up towards the hinder angle of the anterior wing, and having the basal portion of the wing with the nervures yellowish-white, and five white spots on the fringe of the outer margin and apex; below bright crimson-brown, with the outer margin broadly edged with dark crimson-brown, and fringed with black and white in broad patches, having on the dark margin a narrow yellow curved line parallel with the inner margin of tail and outer margin, inside of which is a band of the ground colour, then a narrow band of yellow; beyond which the nervures are bright yellow. Body above dark-brown, with the segments of the abdomen margined with yellow; body beneath and legs yellowish-white.

Expansion of wings 1-$\frac{8}{10}$ inch.

Bogota. In the collection of the British Museum, and W. W. Saunders.

A very distinct species, with the crimson spot in the posterior

wings much varying in size, sometimes reduced to a mere curved narrow band.

5. *Erateina margarita*, W. W. S. ♂. (Pl. XVI. figs. 2, 2 *a*.)

Head, antennæ and thorax black, the former having two yellow lines alongside the eyes, and the latter narrowly margined in front with white, and having two fine longitudinal streaks, one on the shoulders and one on the vertex of the same colour. Anterior wings above black, with a large white semi-transparent oval transverse spot in the centre of the disk, and a band of the same colour arising from the base of the wing and curving backwards, nearly parallel with the inner margin, gradually increasing in width, and terminating before the internal angle; below red-brown, with a silvery-white band corresponding in position with the oval spot on the upper side, but elongated so as to touch the anterior margin, and also the inner margin; the latter being reached by a line-like production parallel to the outer margin, and also another silvery band corresponding with the curved band on the upper side, and also with a silvery streak arising from the base of the wing and running a short distance on to the disk. Posterior wings slightly elongated and rounded at the apex; above black, with a large oval white spot on the disk, from which there is a pointed elongation of the same colour in direction of the apex of the wing, and with five white spots on the fringe of the outer margin and apex; below red-brown, with a semi-oval fold, and with a silver spot corresponding with the white spot on the upper side, excepting that the prolongation suddenly curves upwards and is continued by a narrow band to the inner margin near the fold, which latter is margined with silver on the curved side. Body above dark-brown; below whitish. Legs whitish, mottled with dark-brown.

Bogota.

Expansion of wings $1\frac{3}{10}$ inch.

In the collection at the British Museum.

This approaches *Cynthia* of Doub., but is smaller, and with markings on the posterior wings of a different character.

6. *Erateina obscura*, W. W. S. ♂. (Pl. XVI. figs. 3, 3 *a*.)

Head and thorax black, the former with the inner margin of the eyes white, and the latter having a white streak on the vertex. Anterior wings above black, with the base greyish, and with an oval-white transverse spot on the disk a little beyond the middle; below red-brown, with a white curved band in the position of

the oval spot of the upper side, commencing on the anterior margin, and continued from the base of the spot by a silvery curved line running nearly parallel with the outer margin, and on to the inner margin, which is broadly suffused with dull silver, and with a silver-forked spot at the base and a transverse streak of the same colour on the basal side of the band; posterior wings narrow, elongated and rounded at the apex; above brownish-black, with a faint white longitudinal streak on the disk; below red-brown, with a small semi-oval fold margined with silver on the curved side, and having on the disk of the wing a very irregular silvery longitudinal band, commencing at a point on the anterior margin, then expanding suddenly and running towards the apex, and terminating in a narrow prolongation reflexed on to the inner margin a little above the anal angle, and also having five spots on the fringe of the outer margin and apex, and the nervures on the basal side of the band white; body black-brown.

Bogota. In the collection of W. W. Saunders.

Expansion of wings $1\frac{2}{10}$ inch.

This species nearly resembles the preceding *margarita*, but differs in the posterior wings being more elongated, the fold narrower, and in the almost uniform colour of the upper side of the former. It is a male, except which, seeing its similarity to *margarita*, I should have made it a variety of that species.

XXIII. *Characters of undescribed* Diptera *in the Collection of W. W. Saunders, Esq., F.R.S., &c.* By Francis Walker, Esq., F.L.S., &c.

[Read February 2nd, 1857.]

BRACHYCERA.

Fam. STRATIOMIDÆ.

Genus Ptilocera, Weid.

Ptilocera Natalensis?

Fœm.—Nigra, capite atro nitente, antennis sub-pectinatis apice albis, thorace vittis duabus smaragdinis, scutelli spinis duabus piceis, pectore argenteo, abdomine vittis quatuor argenteis, pedibus ferrugineis, alis sub-cinereis apices versus sub-obscurioribus, macula costali nigricante, halteribus ferrugineis apice nigris.

Ptilocera Natalensis, Gerstäcker, Linn. Ent. xl. 334, 3.

Female.—Black: head deep black, shining; antennæ a little longer than the breadth of the head, minutely pectinated, white at the tips; thorax with two emerald-green stripes; scutellum with four piceous spines; pectus with silvery tomentum; abdomen with four stripes of silvery tomentum, the middle pair much abbreviated in front; legs ferruginous, with silvery tomentum; wings slightly greyish, a little darker towards the tips; a blackish spot by the middle of the costa; veins black for half the length, testaceous from thence to the tips; halteres ferruginous, with black knobs.

Length of the body 4 lines; of the wings 8 lines.

This is probably the female of *P. Natalensis*, which is described as having the wings yellow, blackish at the base.

Natal.

Genus Cyphomyia, Wied.

Cyphomyia simplex.

Fœm.—Nigra, capite testaceo, scutelli spinis duabus robustis, pectore albido, abdomine cyaneo, genubus anticis albidis,

tarsis albis apice nigris, alis obscure cinereis, stigmate venisque nigris, halteribus testaceis apice nigris.

Female.—Black: head testaceous, paler hindward; antennæ black, longer than the breadth of the head; pectus with whitish tomentum; scutellum with two stout spines; abdomen blue, much broader but hardly longer than the thorax; tip attenuated; foreknees whitish; tarsi white, with black tips; wings dark grey; stigma and veins black; halteres testaceous, with black knobs.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

This is nearly allied to *C. varipes*, Gerstäcker, but may be distinguished from that species by its black thorax.

Note.—Two works on *Diptera* have appeared since these descriptions were offered to the Entomological Society.

The first is, "Catalogue of the described *Diptera* of North America. Prepared for the Smithsonian Institution by R. Osten Sacken." This work includes the *Diptera* of Mexico, of Central America and of the West Indies, and indicates, as far as possible, the locality where each species has been discovered, and the instances of the extension of its range to South America, and thus brings together large materials for the knowledge of the geographical distribution of species.

The other work is "Saggio di Ditterologia Messicana di Luigi Bellardi, Professore di Storia Naturale. Parte 1ª. Torino. 1859."

The first part contains the *Nemocera*, and the families *Stratiomidæ*, *Tabanidæ* and *Acroceridæ* of the *Brachycera*. The descriptions are distinct and complete, and are accompanied by two plates, in which the characters of the species are very well delineated.

Genus Stratiomys, Geoffr.

Stratiomys constricta.

Mas.—Atra, capite antico sub-argenteo, scutelli spinis duabus piceis, abdominis segmentis sub-argenteo-fasciatis, apice piceo, tibiis posticis tarsisque fulvis, alis obscure fuscis basi luridis apices versus limpidis.

Male.—Deep black: head with slightly silvery tomentum in front, and with grey pubescence beneath and behind; scutellum with two piceous spines; abdomen piceous at the tip, and with a band of slightly silvery tomentum on each segment; tarsi and hind tibiæ tawny; wings lurid at the base, dark brown

from thence to more than half the length, vitreous and colourless towards the tips.

Length of the body 6 lines; of the wings 12 lines.

Mexico.

Stratiomys pinguis.

Fœm.—Nigricans, capite ferrugineo-tomentoso antice albido-pubescente, thorace ferrugineo-tomentoso vittis duabus ferrugineis, scutelli spinis duabus ferrugineis, abdominis segmentis sub-aurato-fasciatis subtus albido-fasciatis vittâ latâ fulvâ, femoribus tibiisque subtus tarsisque fulvis, alis limpidis apud costam luridis.

Female.—Blackish. Head with ferruginous tomentum, above with whitish pubescence in front; hind side with silvery tomentum. Antennæ black; third joint lanceolate towards the tip, much longer than the first. Thorax with ferruginous tomentum, and with a ferruginous stripe along each side. Scutellum with two ferruginous spines. Abdomen with bands of slightly gilded tomentum on the borders of each segment; underside with bands of whitish tomentum, which are dilated on each side, and with a broad tawny discal stripe. Femora and tibiæ beneath and tarsi tawny. Wings vitreous, lurid along the costa from the base to nearly two-thirds of the length.

Length of the body 6 lines; of the wings 12 lines.

This may possibly be the female of *S. constricta*, though so different from it in appearance.

Mexico.

Genus Clitellaria, Meig.

Clitellaria obesa.

Mas.—Cyanea, capite antennisque nigris, thorace conico, scutello spinis quatuor, abdomine nigro sub-punctato, pedibus nigris, tarsis fulvis, alis sub-cinereis basi fuscescentibus, macula costali fusca, venis nigris.

Male.—Dark blue, thick. Head black. Antennæ black, shorter than the breadth of the head; third joint linear, acuminated; arista shorter than the third joint. Thorax conical. Scutellum with four spines. Abdomen black, minutely punctured, not longer than broad. Legs black; tarsi tawny. Wings greyish-vitreous, brownish at the base, and with a brown spot by the costa before half the length; veins black.

Length of the body 4 lines; of the wings 10 lines.

Mexico.

Genus Chrysochlora, Latr.

Chrysochlora purpurea.

Mas.—Cyaneo-purpurea, antennis, coxis femoribusque nigris, thorace nigro-pubescente, femoribus subtus plus minusve testaceis, tibiis tarsisque pallide testaceis, alis fuscescente cinereis striga fusca, venis nigris, halteribus albidis.

Male.—Purple, varied with blue. Antennæ black. Thorax with short black pubescence. Coxæ and femora black; femora more or less testaceous beneath; tibiæ and tarsi pale testaceous. Wings brownish-grey, with a brown streak on each side of the discal vein from the base to half the length; veins black. Halteres whitish.

Length of the body 6 lines; of the wings 14 lines.

Mexico.

Genus Sargus, Fabr.

Sargus subinterruptus?

Mas?—Testaceus, capite atro subtus albido, antennarum articulo 3° nigro-notato, aristâ nigrâ, abdomine fasciis quatuor (unâ integrâ tribusque interruptis) apiceque nigris, femoribus posticis supra basique nigricantibus, tibiis posticis atris, alis sub-cinereis extus fuscescentibus, venis nigris.

Male?—Testaceous. Head deep black above, whitish beneath. Antennæ short; third joint round, marked with black; arista black, stout at the base. Abdomen paler than the thorax, with four black bands and a black tip; second, third and fourth bands each composed of two large round spots. Hind femora blackish above at the base; hind tibiæ deep black. Wings brownish, very slightly greyish for nearly half the length from the base; veins black.

Length of the body 5 lines; of the wings 8 lines.

Mexico.

Sargus subinterruptus, mas? Bellardi, Ditt. Mess. i. 44, 9, pl. 1, f. 22.

Sargus rufibasis.

Fœm.—Lurido-nigricans, antennarum articulo 3° ferrugineo, abdomine purpurascente, disco basali apiceque lurido-rufis, pedibus albis, femoribus dimidio apicali nigris, alis sub-cinereis extus fuscescentibus, venis nigris, halteribus testaceis.

Female.—Blackish, with a lurid tinge. Antennæ black; third

joint ferruginous, nearly oval; seta slender, a little longer than the rest of the antennæ. Abdomen purplish, lurid red at the tip and in the disk towards the base. Legs white; femora black for about half the length from the tips. Wings brownish, greyish for nearly half the length from the base; veins black. Halteres pale testaceous.

Length of the body 5 lines; of the wings 10 lines.

Natal.

Fam. TABANIDÆ.

Genus Pangonia, Latr.

Pangonia atrifera.

Mas.—Atra, proboscide thoracis longitudine, thorace nigro-pubescente, abdominis lateribus nigro-pilosis, tarsis subtus piceis, alis nigricantibus apice et apud marginem interiorem obscure cinereis, venæ cubitalis ramo antico furcam emittente.

Male.—Deep black. Proboscis as long as the thorax. Antennæ black, not dentate. Thorax with thick black pubescence. Abdomen broader and a little longer than the thorax, with short black hairs along each side. Tarsi piceous beneath. Wings blackish, dark cinereous at the tips and along the interior border; veins black; fore branch of the cubital vein emitting a fork at its angle.

Length of the body 8 lines; of the wings 16 lines.

Allied to *P. rhinophora*, Bellardi.

Mexico.

Pangonia tenuirostris.

Mas.—Cervina, capite antico ferrugineo, proboscide non thoracis longitudine, palpis antennisque fulvis, thorace abdomineque aurato-pubescentibus albido-sub-tomentosis, abdomine pedibusque fulvis, alis obscure cinereis basi et apud costam fuscescentibus, venæ cubitalis ramo antico furcam emittente, halteribus apice albidis.

Allied to *P. leucopogon*, Wd. *Male.*—Fawn-colour: head ferruginous in front, whitish hindward, with pale hairs beneath; proboscis slender, shorter than the thorax; palpi and antennæ tawny, the latter slender and simple; thorax and abdomen with gilded pubescence, and with very slight whitish tomentum; abdomen and legs tawny; wings dark-grey, brownish at the base and

along the costa; fore branch of the cubital vein emitting a fork near its base; hind branch joining the first externo-medial vein at some distance from the border; sub-anal joining the anal at some distance from the border; halteres with whitish tips.

Length of the body 6 lines; of the wings 14 lines.

Mexico.

Genus Tabanus, Linn.

Tabanus dorsifer.

Fœm.—Glauco-cinereus, capite albido pilis subtus albis, callo nigro postice lato antice sub-quadrato ferrugineo, palpis albidis, antennis parvis, thoracis vittis quinque pectoreque albidis, abdomine maculis lateralibus ferrugineis, segmentorum marginibus maculisque quatuor trigonis lateralibus albis, tibiis fulvis apice nigris, alis cinereis, halteribus apice albidis.

Allied to *T. dorsiger*, Wd. *Female.*—Glaucous-cinereous: head whitish, with white hairs beneath; callus black, broad, attenuated in front, and joining a ferruginous shining sub-quadrate spot; proboscis black; lancets luteous; palpi whitish; antennæ black, small; third joint slightly dilated and angular; thorax with five whitish stripes; pectus whitish; abdomen with dull ferruginous spots on each side; hind borders of the segments white; a large triangular white spot on each of the third and fourth segments; legs black; tibiæ tawny, with black tips; wings cinereous; veins black; fore branch of the cubital vein obtusely angular at its base, not emitting a fork; sub-anal vein joining the anal at some distance from the border; halteres with whitish knobs.

Length of the body 6½ lines; of the wings 13 lines.

Mexico.

Tabanus commixtus.

Fœm.—Fuscus, capite cervino subtus albido pilis albis, callo gracillimo antice dilatato quadrato, palpis albidis, antennis fulvis apice nigris, thorace cinereo, pectore albido pilis albis, abdomine vittis tribus (lateralibus macularibus) testaceis, ventre pallide testaceo, pedibus testaceis, tarsis femoribus basi tibiisque apice nigris, alis cinereis, venis transversis vix nebulosis, halteribus albis.

Allied to *T. rufiventris*, Macq., but with a longer and narrower abdomen. *Female.*—Brown: head fawn-colour, with a very slender

callus, in front of which there is a black shining quadrate spot; underside whitish, with white hairs; palpi whitish; antennæ tawny, dilated into a tooth at the base of the third joint, black towards the tips; thorax with cinereous tomentum; pectus whitish, with white hairs; abdomen with three testaceous stripes; the lateral stripes composed of oblique elongated testaceous spots; underside pale testaceous; legs testaceous; tarsi, femora at the base, and tibiæ at the tips, black; fore legs deep black, their tibiæ testaceous for half the length from the base; wings grey; veins black, ferruginous at the base; transverse veins hardly clouded; fore branch of the cubital vein obtusely angular at the base, not emitting a branch; sub-anal vein joining the anal at some distance from the border; halteres white.

Length of the body $5\frac{1}{2}$ lines; of the wings 10 lines.

Mexico.

Tabanus alteripennis.

Fœm.—Ferrugineus, capite albido, callo gracillimo, antennis luteis, dente apiceque nigris, thorace vittis tribus obscurioribus, pectore cano, abdomine apicem versus nigricante, pedibus anticis nigris, alis obscure cinereis albo-trimaculatis, stigmate nigricante, halteribus albidis apice nigris.

Allied to *T. diversipennis*. *Female.*—Ferruginous: head with whitish tomentum; callus very slender; eyes nearly contiguous above; proboscis black; antennæ luteous, black towards the tips; third joint slightly dilated, and with a minute black tooth near its base; thorax with three indistinct darker stripes; pectus hoary; abdomen blackish above towards the tip, with the exception of the hind borders of the segments; fore legs black; wings dark grey, with three white spots on the disk of each, the third spot smaller than the other two, and on the base of the fore branch of the cubital vein, which has the usual form, and emits no fork; stigma blackish; halteres whitish, with black knobs.

Var. B. Darker: abdomen not blackish towards the tip; wings partly blackish.

Length of the body $4\frac{1}{2}$ lines; of the wings 10 lines.

Mexico.

Tabanus purus.

Fœm.—Pallide testaceo-flavus, callo longo gracili antice subdilatato, proboscide nigro, thorace pectoreque albido-subtomentosis, alis limpidissimis, venis albido-testaceis, venæ

cubitalis ramo antico angulato furcam emittente, stigmate flavescente, halteribus albidis.

Allied to *T. inconspicuus*. *Female*.—Pale testaceous yellow: head with the callus long and slender, but slightly dilated in front; proboscis black; antennæ with the third joint very small and slender, but dilated and angular towards its base; thorax and pectus with slight whitish tomentum; abdomen somewhat brighter than the thorax. Wings quite vitreous; veins whitish testaceous, somewhat darker along the costa; fore-branch of the cubital vein forming a well-defined obtuse angle at its base, and there emitting a fork; sub-anal vein joining the anal at some distance from the border; stigma yellowish; halteres whitish.

Length of the body 4½ lines; of the wings 9 lines.

Mexico.

Tabanus incipiens.

Fœm.—Niger, capite albido. callo nigro tenui antice posticeque dilatato sub-quadrato, palpis albis, antennis ferrugineis, thorace cinereo, pectoris lateribus albidis, segmentorum abdominalium marginibus posticis maculisque dorsalibus trigonis albidis, tibiis albis apice nigris, alis sub-cinereis, venæ cubitalis ramo antico angulato furcam brevissimam emittente.

Allied to *T. trinotatus*, Wd. *Female*.—Black: head whitish, with a very slight callus between two black sub-quadrate shining spots; palpi white; antennæ ferruginous; third joint hardly dilated; thorax with cinereous tomentum; pectus whitish on each side; abdomen with a whitish band on the hind border of each segment, these bands dilated and angular in the middle above; tibiæ white, with black tips; wings greyish; veins black; fore-branch of the cubital vein forming a well-defined slightly obtuse angle at its base, and then emitting an extremely short fork; sub-anal vein joining the anal very near the border.

Length of the body 3½ lines; of the wings 7 lines.

Amazon region.

Tabanus abscondens.

Fœm.—Nigricans, capite subtus pilis albis, callo longo gracili antice sub-dilatato, palpis fulvis, antennis parvis obscure ferrugineis apice nigris, thoracis lateribus ferrugineis, abdominis segmentis ferrugineo-marginatis, ventre ferrugineo fasciis abbreviatis nigris, pedibus fulvis, tibiis anticis apice femoribus anticis tarsisque anticis nigris, alis sub-cinereis, halteribus albidis.

Allied to *T. tenebrosus*. *Female*.—Blackish. Head with white

hairs beneath; callus long, slender, slightly wider in front. Palpi tawny. Antennæ small, dark ferruginous, black towards the tips; third joint with a very small tooth. Thorax ferruginous on each side; pectus partly ferruginous, with white hairs. Abdomen with the hind borders of the segments ferruginous; underside ferruginous, with short black bands. Legs tawny; fore-femora, fore-tarsi and tips of the fore-tibiæ black. Wings greyish; veins black, ferruginous at the base; fore-branch of the cubital vein obtusely angular at its base, not emitting a branch; sub-anal vein joining the anal at some distance from the border. Halteres whitish.

Length of the body 6½ lines; of the wings 14 lines.

Burmah.

Fam. ACROCERIDÆ.

Genus Cyrtus, Latr.

Cyrtus orbifer.

Mas.—Niger, proboscide corporis longitudine, antennis basi testaceis, thorace pilis pallidis fulvis dense vestito, abdominis segmentis testaceo-marginatis, pedibus pallide luteis, alis sub-cinereis, venis nigris.

Male.—Black; proboscis curved towards the tip, as long as the body; antennæ very slender, testaceous at the base; thorax thickly clothed with pale tawny hairs; abdomen with a testaceous band on the hind border of each segment; legs pale luteous; wings slightly cinereous; veins black, well defined.

Length of the body 5 lines; of the wings 10 lines.

Natal.

Fam. ASILIDÆ.

Sub-fam. Dasypogonites.

Genus Dasypogon, Fab.

Dasypogon secabilis.

Fœm.—Aurato-flavus, capite supra nigro fascia antica ferruginea, mystace aurato, proboscide palpis antennisque fulvis, thorace fulvo vittis duabus latissimis cinereo-ferrugineis tribusque angustis incompletis sub-auratis, abdomine nigro segmentorum marginibus aurato-flavis, pedibus fulvis nigro-spinosis, femoribus posterioribus basi nigris, alis cinereis, venis fulvo-vittatis, halteribus flavis.

Group of *D. brunneus;* see Cat. Dipt. 2nd series, ii. 420.

Female.—Gilded yellow. Head black between the eyes; front flat, with a short ferruginous stripe extending from the base of the antennæ; mystax with a few pale gilded bristles. Proboscis, palpi and antennæ tawny; third joint of the antennæ sub-lanceolate, rather longer than the first and the second together. Thorax tawny; two very broad ferruginous cinereous-tinged stripes; three slight somewhat incomplete pale gilded stripes, the lateral pair between the ferruginous stripes and the pectus, which is partly ferruginous; scutellum gilded yellow. Abdomen black, with a gilded yellow band on the hind border of each segment. Legs tawny, stout, long, with black spines; posterior femora black towards the base. Wings cinereous, with tawny stripes along the black veins. Halteres pale yellow.

Length of the body 10 lines; of the wings 18 lines.

This species has some resemblance to *D. Mexicanus*, Macq., but may be distinguished by the colour of the thorax.

Mexico.

Dasypogon gelascens.

Mas.—Argenteo-albus, capite subtus albo-piloso, epistomate plano, mystace albo, antennis nigris, thoracis disco cinereo, abdomine fasciis duabus latis abbreviatis nigris, pedibus validis albo-setosis, alis sub-cinereis, halteribus albis.

Male.—Pure silvery-white: head with white hairs beneath; epistoma quite flat; mystax with white bristles; proboscis and antennæ black; disk of the thorax cinereous; abdomen with two broad abbreviated black bands; legs stout, with white bristles; ungues black; wings slightly greyish; veins black; halteres white.

Length of the body 4 lines; of the wings 7 lines.

Mexico.

Dasypogon proclivis.

Mas.—Niger, capite antico rufescente, mystace albido, antennis basi ferrugineis, thorace cinereo, abdomine rufo, maculis quatuor lateralibus apice ventreque nigris, guttis quatuor lateralibus albidis, pedibus fulvis validis, tarsorum articulis apice nigris, alis fuscis postice cinereis, halteribus rufescentibus.

This and the two following species belong to the group of *D. Spectrum*. See Cat. Dipt., 2nd Ser., ii. 471. *Male.*—Black. Head reddish in front; mystax with ten whitish bristles. Antennæ ferruginous towards the base; third joint nearly linear,

longer than the first and the second. Thorax with cinereous tomentum. Abdomen red-black at the tip, and with two black spots and two whitish dots on each side; underside black. Legs tawny, stout; coxæ black; joints of the tarsi with black tips. Wings brown, dark greyish along the hind border; veins black. Halteres reddish.

Length of the body 7 lines; of the wings 14 lines.

Burmah.

Dasypogon inopinatus.

Mas.—Niger, capite pectoreque auratis, mystace albido, thorace vittis quatuor auratis maculisque duabus humeralibus fulvis, abdomine nigro-æneo nitente maculis transversis lateralibus albidis, pedibus fulvis validis, alis sub-luridis apice cinereis, halteribus fulvis.

Male.—Black. Head in front ferruginous, or whitish gilded, according to the direction in which it is viewed. Mystax whitish. Third joint of the antennæ almost linear, hardly tapering from the base to the tip, rather longer than the first and the second together. Thorax with four gilded stripes, and with a tawny spot on each shoulder. Pectus mostly gilded. Abdomen æneous black, shining; hind borders of the segments with transverse whitish spots on each side. Legs tawny, stout; spines paler. Wings slightly lurid, cinereous towards the tips; veins tawny, black towards the tips and along the hind border. Halteres tawny.

Length of the body $8\frac{1}{2}$ lines; of the wings 16 lines.

Burmah.

Dasypogon inopportunus.

Fœm.—Niger, capite albido nitente pilis subtus albidis, mystace albo, abdomine nigro-cupreo pilis apicalibus albidis, femoribus tibiisque anticis apice fulvis, alis nigricantibus postice pallidioribus, halteribus testaceis apice nigris.

Female.—Black. Head with whitish tomentum and hairs, white and shining or tawny in front according to the direction in which it is viewed; mystax white. Palpi with stout black bristles. Third joint of the antennæ slightly attenuated from the middle to the tip, much longer than the first and the second together. Abdomen cupreous black, with some short whitish hairs at the tip. Tips of fore-femora and fore-tibiæ towards the tips tawny; spines pale testaceous. Wings blackish, somewhat paler along the hind border; veins black. Halteres testaceous, with black knobs.

Length of the body 8 lines; of the wings 16 lines.

Burmah.

Dasypogon decretus.

Mas.—Ater, capite cinereo pilis subtus albidis, mystace nigro, antennarum articulo 3° clavato, thorace vittis duabus cinereis duabusque lateralibus albidis, abdomine albo-canescente, pilis lateralibus albidis, sexualibus rufis maximis, tibiis anterioribus testaceis, femoribus anticis fulvo-strigatis, alis cyaneo-nigris, halteribus ferrugineis.

Genus *Microstylum*, Macq. *Male.*—Deep black. Head with cinereous tomentum, with some whitish hairs beneath; mystax with a few black bristles. Third joint of the antennæ clavate, a little longer than the first and the second together. Thorax with two cinereous stripes, and with two lateral whitish stripes, which are much more distinct than the cinereous pair. Pectus with whitish hairs. Abdomen with hoary white tomentum above; second, third and fourth segments with whitish hairs on each side; sexual appendages red, very large. Anterior tibiæ testaceous; fore femora with a slight tawny streak. Wings bluish black. Halteres ferruginous.

Length of the body 7 lines; of the wings 12 lines.

Burmah.

Genus Discocephala, Macq.

Discocephala divisa.

Fœm.—Nigra, thorace sat convexo, lateribus pectoreque cinereis, pedibus validis, alis nigris fascia lata alba, halteribus apice albidis.

Female.—Black: eyes in front flat and with large facets; thorax somewhat convex, cinereous on each side; pectus cinereous; legs stout; wings black, with a broad white band beyond the middle; halteres with whitish knobs.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

Discocephala interlineata.

Fœm.—Nigra, capite albido, thorace vittis quatuor luteis postice connexis, lineis duabus interioribus indistinctis pallidis, scutello pallide luteo, pectore albido, abdominis lateribus ventreque cinereis, pedibus albido-setosis, tarsis posticis subtus aurato-tomentosis, alis nigricantibus, halteribus albis.

Female—Black: head whitish; thorax with four pale luteous stripes, which are united hindward; two indistinct pale lines between the interior stripes, which are abbreviated in front; scutellum

pale luteous; pectus whitish; abdomen cinereous on each side and beneath; legs with rather long whitish bristles; hind tarsi with gilded tomentum beneath; wings blackish, black towards the base along the costa; halteres white.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

Sub-Fam. LAPHRITES.

Genus Lampria, Macq.

Lampria bitincta.

Mas.—Nigra, capite antico ferrugineo, pilis subtus albidis, abdomine fulvo depresso lineari, pedibus fulvis, femoribus validis, tibiis posticis dilatatis arcuatis ciliatis, alis obscure cinereis apud costam basalem luteis, halteribus testaceis.

Male.—Black: head ferruginous in front, with whitish hairs beneath; proboscis porrect; abdomen tawny, flat, linear; legs tawny; femora stout, especially the hind pair; hind tibiæ dilated, curved, ciliated; wings dark grey, a little paler along the hind border, luteous along the costa for more than one-third of the length from the base; hind branch of the cubital vein and first externomedial vein united at some little distance from the border; third and fourth externomedial veins united at some distance from the border; sub-anal and anal veins united far from the border; halteres testaceous.

Length of the body 4 lines; of the wings 8 lines.

Amazon Region.

Genus Laphria, Fabr.

Laphria formidolosa.

Mas.—Nigra, capite albo-piloso, mystace nigro, antennarum articulo 3° fusiformi, thoracis vittis tribus angustis pectoreque canis, abdomine rufescente lanceolato, ventre nigro, pedibus validis albido-pilosis et nigro-setosis, alis nigricantibus, halteribus pallide testaceis.

Group of *L. Amandus*. See Cat. Dipt. 2nd Ser. iii. 533. *Male.*—Black, with black hairs. Head with white hairs on each side of the front, and beneath; front prominent and with numerous black bristles in the disk. Third joint of the antennæ fusiform, a little longer than the first and the second together. Thorax with three slender hoary stripes. Pectus hoary. Abdomen reddish, lanceolate; underside black and with black hairs, reddish

and with reddish hairs at the tip. Legs stout, with whitish hairs and black bristles. Wings blackish; veins black; fore-fork of the cubital vein slightly curved; hind fork and first externomedial vein united on the border; third externomedial vein curved, joining the fourth rather far from the border. Halteres pale testaceous.

Length of the body 10 lines; of the wings 18 lines.

Mexico.

Laphria componens.

Mas.—Nigra, capite albo, epistomate plano, mystace nigro, antennarum articulo 3° fusiformi, thoracis vittis duabus anticis pectoreque cinereis, abdomine cyanescente purpureo, pilis lateralibus albidis, tibiis anterioribus testaceis, tarsis subtus et tarsis anterioribus basi testaceis, alis cinerascentibus, halteribus albido-testaceis.

Male.—Black: head with white tomentum; vertex with two long setæ on the tubercle; epistoma quite flat, with a few slight white bristles; proboscis short, lanceolate; third joint of the antennæ fusiform, a little longer than the first and the second together; thorax with two cinereous stripes in front; pectus cinereous; abdomen bluish-purple, with whitish hairs along each side; legs rather slender, with long slender bristles; anterior tibiæ testaceous; tarsi beneath and anterior tarsi at the base testaceous; wings greyish; veins black; halteres whitish testaceous.

Length of the body 3½ lines; of the wings 7 lines.

Mexico.

Laphria triligata.

Fœm.—Nigra, capite apud oculos argenteo, pilis subtus albidis, mystace nigro, antennarum articulo 3° subfusiformi, pectore cinereo, abdomine rufo, basi nigro, alis nigricantibus basi sub-limpidis.

Female.—Black, and with black hairs: head silvery about the eyes, and with whitish hairs beneath; face convex towards the epistoma; mystax with several black bristles; proboscis porrect; third joint of the antennæ sub-fusiform, a little longer than the first and the second together; pectus cinereous; abdomen red, black at the base; wings blackish, nearly colourless towards the base; veins black.

Length of the body 3½ lines; of the wings 6½ lines.

Mexico.

Laphria abscissa.

Fœm.—Nigra, mystace nigro, abdomine apicem versus sublatiore, pedibus validis, alis nigricantibus dimidio ferè basali sub-limpidis.

Female.—Black: front prominent; mystax with black bristles; proboscis porrect; abdomen a little broader towards the tip, longer than the thorax; legs stout; wings blackish, almost colourless for nearly half the length from the base.

Length of the body 4 lines; of the wings 8 lines.

Burmah.

Genus Atomosia, Macq.

Atomosia sericans.

Mas.—Nigra, fronte cinerascente, tibiis tarsisque anterioribus testaceis, tibiis posticis fulvis apice nigris, tarsis posticis basi fulvis, alis nigricantibus, venis nigris, halteribus albidis.

Male.—Black: head with somewhat cinereous tomentum in front; anterior tibiæ and tarsi testaceous, with paler shining tomentum; hind tibiæ tawny, with black tips, slightly clavate; hind tarsi slightly dilated, tawny at the base; wings blackish, darkest along the costa beyond the middle; veins black; halteres whitish.

Length of the body $2\frac{1}{2}$ lines; of the wings $4\frac{1}{2}$ lines.

Mexico.

Sub-Fam. ASILITES.

Genus Trupanea, Macq.

Trupanea apivora.

Fœm.—Cinereo-nigra, capite subtus pilis albidis, fronte rufescente, thorace vittis tribus indistinctis cinereis, pectore cinereo, abdomine segmentis cinereo-marginatis, apice nigro nitido, pedibus fulvis, coxis genubus tarsisque nigris, alis fuscescentibus, venis nigris basi fulvis.

Female.—Cinereous black: head with whitish hairs beneath; front prominent, reddish, with pale hairs; thorax with three indistinct cinereous bands; pectus cinereous; abdomen with a cinereous band on the hind border of each segment, with whitish hairs towards the base; tip black and shining; legs tawny, very stout; coxæ, knees and tarsi black; wings brownish; veins black, tawny at the base.

Length of the body 9 lines; of the wings 14 lines.

Burmah.

"This fly devours the very large black bees."—MSS.

Trupanea lateralis.

Mas.—Nigra, capite subtus pilis albidis dense vestito, fronte fulva pilis sub-auratis, mystace aurato, thorace vittis tribus indistinctis cinereis, lateribus pectoreque canis, abdomine vittis duabus lateralibus latis testaceo-albidis subtus cinereo, pedibus robustis, tibiis luteis apice nigris, alis cinereis, striga sub-costali sub-apicali obscuriore.

Male.—Black: head tawny in front, thickly clothed with whitish hairs beneath; front with numerous slightly gilded hairs; epistoma with many gilded bristles; thorax with three indistinct cinereous stripes; sides and pectus hoary; abdomen with two broad testaceous whitish stripes; underside cinereous; legs very stout; tibiæ luteous, with black tips; wings cinereous, with a dark grey steak along the apical part of the costa; veins black, normal.

Length of the body 7 lines; of the wings 12 lines.

Mexico.

Genus Asilus, Linn.

Asilus inamatus.

Fœm.—Niger, capite albido, fronte sub-testacea setis nigris, epistomate plano, mystace albido, thorace fasciis duabus indistinctis cinereis, lateribus pectoreque canis, abdomine sub-cinereo, tibiis fulvis apice nigris, alis sub-cinereis, venis nigris.

Female.—Black: head with whitish tomentum, front with slightly testaceous tomentum, wholly beset with black bristles; epistoma quite flat, with some whitish bristles; thorax with two indistinct cinereous stripes; sides and pectus hoary; abdomen slightly cinereous; tibiæ tawny, black towards the tips, wings greyish; veins black.

Length of the body 4 lines; of the wings 7 lines.

Mexico.

Asilus perrumpens.

Mas.—Cinereus, capite pilis subtus albis, mystace setis inferioribus albidis superioribus nigris, antennis nigris, thorace vittâ latâ nigricante vittam angustam cineream includente, abdominis segmentis nigro late marginatis, pedibus robustis, alis cinereis, halteribus albidis apice fulvis.

Male.—Cinereous: head with black bristles behind, and with white hairs beneath; front slightly convex towards the epistoma; mystax with several whitish bristles, above which are some shorter

black bristles; proboscis and antennæ black; thorax with a broad blackish stripe, including a slender cinereous stripe; abdomen with a broad black band on the fore-border of each segment, wholly pale cinereous towards the tip; legs very stout, with pale cinereous hairs and black spines; wings cinereous, extending very little beyond the tip of the abdomen; veins black; fore-fork of the cubital vein forming a nearly right angle, which emits a short branch; halteres whitish, with tawny knobs.

Length of the body 8½ lines; of the wings 14 lines.

Mexico.

Genus Damalis, Fabr.

Damalis signatus.

Fœm.—Testaceus, capite nigricante, epistomate plano, setis quatuor nigris, antennis nigris, thoracis disco nigro valde convexo, abdominis maculis lateralibus apiceque nigris, pedibus fulvis validis nigro-setosis, femoribus posticis nigro-spinosis, alis vitreis sub-luridis, venis nigris basi et apud costam testaceis.

Female.—Testaceous: head blackish, testaceous about the base of the proboscis; epistoma quite flat, with four black bristles; antennæ black; thorax very convex, its disk black; abdomen black towards the tip, and with a row of black spots on each side; legs tawny, stout, with black bristles; hind femora with black spines; wings vitreous, with a slight lurid tinge; veins black, testaceous at the base and along the costa.

Length of the body 4 lines; of the wings 9 lines.

Burmah.

Fam. LEPTIDÆ.

Genus Chrysopila, Macq.

Chrysopila trifasciata.

Fœm.—Picea, capite pectoreque cano-tomentosis, proboscide testaceo, antennis nigris, thorace sub-cinereo, abdomine nigro, segmentis testaceo-marginatis, pedibus testaceis, tarsis nigricantibus, alis sub-cinereis extus et apud venas obscurioribus, stigmate nigricante, halteribus pallide testaceis apice nigris.

Female.—Piceous: head and pectus with hoary tomentum; proboscis testaceous; antennæ black; thorax with a slight cinereous tinge; abdomen black, with a testaceous band on the hind border of each segment; legs testaceous; tarsi blackish;

wings greyish, dark grey along the veins and on more than one-third of the length from the tips; stigma blackish; veins black; fore-fork of the cubital vein nearly rectangular and emitting a rudimentary fork at its base; halteres pale testaceous, with black knobs.

Length of the body 3 lines; of the wings 6 lines.

Mexico.

Chrysopila basalis.

Mas.—Picea, capite pectoreque cano-tomentosis, antennis nigris, thorace vittis tribus testaceis, abdomine basi pedibusque pallide testaceis, tarsis nigricantibus, alis limpidis, stigmate magno nigricante, venis nigris.

Male.—Piceous: head and pectus with hoary tomentum; antennæ black; thorax with three dull testaceous stripes; abdomen pale testaceous at the base; legs pale testaceous; tarsi blackish; wings vitreous; stigma large, blackish; veins black.

Length of the body $2\frac{3}{4}$ lines; of the wings $5\frac{1}{4}$ lines.

Mexico.

Fam. BOMBYLIDÆ.

Sub-fam. Anthracites.

Genus Anthrax, Fabr.

Anthrax trifigurata.

Fœm.—Nigra, capite testaceo, thorace fuscescente tomentoso setis anticis lateralibus nigris, abdomine fasciâ anticâ maculis duabus transversis apiceque argenteis, alis sub-cinereis apud costam fuscescentibus, fasciis quatuor nigro-fuscis e maculis confluentibus, guttis duabus sub-apicalibus fuscis.

Group of *A. Proserpina*. See Dipt. Saund. 165. *Female.*—Black: head with testaceous tomentum; antennæ and legs black; thorax with brownish tomentum, with black bristles on each side in front; abdomen with a silvery band near the base, with a transverse silvery spot on each side hindward, and with a silvery tip; wings slightly greyish, brownish along the costa, and with four blackish-brown irregular bands, which are composed of confluent spots: first band basal; second, third and fourth connected in front; two sub-apical brown dots, the fore one much larger than the hind one.

Length of the body $7\frac{1}{2}$ lines; of the wings 18 lines.

Haiti.

Genus Bombylius, Linn.

Bombylius albavitta?

Fœm.—Fuscus, subtus testaceus albido-tomentosus, antennis nigris, thorace vittis duabus lateralibus albidis postice connexis, abdomine vittâ argenteâ, lateribus albidis, pedibus testaceis, tarsis nigris, alis antice fuscis postice sub-cinereis.

Bombylius albavitta? Macq. Dipt. Exot. Suppl. 1850, 421, 54, pl. 11, f. 5. *Female.*—Brown testaceous, and with whitish tomentum beneath: head whitish beneath; proboscis a little longer than the breadth of the head; antennæ black, slender; thorax with two whitish lateral stripes, which are united behind the scutellum; abdomen with a silvery stripe, whitish along each side; legs testaceous; tarsi black; wings brown in front, greyish hindward, the grey part occupying the tips, but not extending to the base of the hind border.

Length of the body 4 lines; of the wings 9 lines.

Australia.

Bombylius furiosus.

Mas.—Ater, pilis nigris dense vestitus, thorace fasciâ anticâ latâ testaceâ, abdomine pilis lateralibus læte rufis, alis subcinereis basi nigris apud costam sub-fuscescentibus.

Male.—Deep black, thickly clothed with black hairs: thorax with a broad testaceous band in front; sides of the abdomen with bright red hairs, which do not extend to the tip; wings slightly greyish, black at the base, slightly brownish along the costa for two-thirds of the length; veins black.

Length of the body 3½ lines; of the wings 6 lines.

Natal.

Fam. EMPIDÆ.

Genus Hybos, Fabr.

Hybos vittatus.

Mas.—Niger, thorace vittis quatuor cinereis, pedibus testaceis, tibiis posticis femoribusque nigris, illis et femoribus anticis apice testaceis, tarsis apice nigris, alis nigricantibus, maculis duabus costalibus cinereis, stigmate venisque nigris.

Male.—Black: proboscis slender, porrect; third joint of the antennæ almost round; arista about twice the length of the rest of the antenna; thorax with four cinereous stripes; legs testaceous; coxæ, femora and hind tibiæ black, the latter and the fore

femora testaceous towards the tips; tarsi with black tips; wings blackish, with a cinereous spot on each side of the stigma, which is black; veins black.

Length of the body 3 lines; of the wings 6 lines.

Natal.

Fam. DOLICHOPIDÆ.

Genus Psilopus, Meig.

Psilopus solidus.

Fœm.—Cyaneo-viridis, robustus, subtus albido-tomentosus, antennis pedibusque nigris, abdominis lateribus basi cupreis, alis sub-cinereis, fasciis duabus (1ª media lata, 2ª apicali latissima) nigris antice connexis, halteribus testaceis.

Female.—Bright bluish-green, stout, with whitish tomentum beneath: antennæ and legs black; abdomen bright cupreous on each side at the base; wings slightly greyish, with a broad black band in the middle and a very broad apical black band, the two bands connected in front; fore branch of the præbrachial vein almost rectangular; discal transverse vein straight, oblique; halteres dull testaceous.

Length of the body 3 lines; of the wings 7 lines.

Mexico.

Psilopus peractus.

Fœm.—Viridis, robustus, subtus albido-tomentosus, capite cyaneo, antennis pedibus halteribusque nigris, abdomine æneo-viridi, alis sub-cinereis, venis nigris.

Female.—Green, stout, with whitish tomentum beneath; head blue; antennæ and legs black; abdomen æneous green; wings greyish; veins black; fore-branch of the præbrachial vein obtusely rectangular; discal transverse vein oblique, almost straight; halteres black.

Length of the body $2\frac{1}{2}$ lines; of the wings 4 lines.

Mexico.

Psilopus hæreticus.

Fœm.—Purpureo-niger, latus, nitens, subtus albido-tomentosus, capite antennis pedibusque nigris, abdomine nigricante purpureo, alis sub-cinereis, venis nigris.

Female.—Purplish-black, broad, shining, with whitish tomentum beneath: head, antennæ and legs black, the latter rather stout; thorax rather thickly beset with black bristles; abdomen blackish-purple; wings slightly greyish; veins black; fore-branch of the

præbrachial vein rectangular, but with the angle somewhat rounded; discal transverse vein oblique, nearly straight.

Length of the body $1\frac{3}{4}$ lines; of the wings $3\frac{1}{2}$ lines.

Mexico.

Psilopus permodicus.

Mas.—Aureo-viridis, gracillimus, antennis pedibusque flavescente albis, alis limpidis, venis halteribusque pallidis.

Male.—Golden-green, very slender: antennæ and legs yellowish-white; wings limpid; veins pale; fore-branch of the præbrachial vein obtusely rectangular; discal transverse vein oblique, straight; halteres very pale.

Length of the body $1\frac{3}{4}$ line; of the wings 4 lines.

Mexico.

Fam. SYRPHIDÆ.

Genus Ceria, Fabr.

Ceria cacica.

Fœm.—Nigra, nitens, capite antico pectoreque albido-tomentosis, scutello albido, abdominis segmentis albido-marginatis, femoribus albido-strigatis, alis nigris postice cinereis, halteribus albidis.

Female.—Black, shining: head with a triangular patch of shining whitish tomentum on each side in front; antennæ longer than the breadth of the head; first and second joints equal in length; third elongate-fusiform, much longer than the second; scutellum whitish; pectus with two whitish patches on each side; abdomen with a whitish band on the hind border of the first, second and third segments; band of the third segment very narrow; femora with whitish streaks, those of the hind femora very short; wings black, greyish along the hind border; halteres whitish.

Length of the body 8 lines; of the wings 13 lines.

Mexico.

Genus Paragus, Meig.

Paragus signatus.

Æneo-niger, capite albido, vittâ anticâ fuscâ nitente, antennis nigris, thoracis lateribus pectoreque testaceo-tomentosis, abdomine testaceo vittis duabus liturâque nigris, pedibus testaceis, femoribus tibiisque posticis nigro-fasciatis, alis sub-cinereis fusco-sub-trifasciatis, halteribus testaceis.

Female.—Æneous-black: head with whitish tomentum; front

somewhat elongated, with a shining brown stripe; proboscis long, black; antennæ black; pectus and sides of the thorax with dull testaceous tomentum; abdomen testaceous above, with a black stripe on each side and a much arched black dorsal mark, which emits two black lines, hindward; underside testaceous at the base; legs testaceous; hind femora and hind tibiæ with a black band on each; wings greyish, with three brownish irregular bands; first band in the middle, abbreviated hindward and interrupted; second and third connected; halteres testaceous.

Length of the body 3 lines; of the wings 5 lines.

Natal.

Genus Eristalis, Latr.

Eristalis transpositus.

Mas et *Fœm.*—Cyaneo-viridis, nitens, capite antico nigro, lateribus aldo-tomentosis, antennis tarsisque nigris, abdominis apice cupreo, alis nigricantibus postice limpidis.

Male and *Female.*—Bluish-green, shining: head black in front, where there is white shining tomentum on each side; antennæ black; abdomen bright cupreous at the tip; tarsi black; wings blackish on the fore half, limpid on the hind border.

Length of the body $7\frac{1}{2}$—$8\frac{1}{2}$ lines; of the wings 16 lines.

Burmah.

Eristalis impositus.

Fœm.—Niger, capite fuscescente antice testaceo, callo fusco, thorace vittis quatuor testaceis, scutello lurido, abdomine atro-velutino, maculis quatuor maximis lateralibus fasciâque tenui arcuatâ flavis, lineis tribus transversis apiceque nigro-chalybeis nitentibus, pedibus halteribusque testaceis, tibiis tarsisque posticis femoribusque nigris, alis sub-cinereis.

Female.—Black: head with brownish tomentum above, with pale shining testaceous tomentum in front, excepting the shining brown callus; antennæ black; thorax with four testaceous stripes; scutellum lurid; abdomen deep velvet-black, with two very large yellow spots on each side, the fore pair larger than the hind pair, beyond which latter there is a slender arched yellow band; three chalybeous black, shining, transverse lines; tip also shining; legs testaceous; femora black, with testaceous tips; hind tibiæ black; hind tarsi black, except at the base; wings slightly greyish; veins black; halteres testaceous.

Length of the body 6 lines; of the wings 10 lines.

Haiti.

Eristalis familiaris.

Mas.—Ater, capite albo, antennis pedibusque nigris, thorace lineis duabus anticis transversis maculisque quatuor posticis elongatis chalybeis, scutelli margine postico nitente, abdomine lituris duabus basalibus transversis albis maculisque quatuor magnis lateralibus flavis, tibiis piceis, alis limpidis basi nigricantibus.

Male.—Deep black: head shining, with white shining tomentum behind and on each side in front; antennæ and legs black; thorax with a transverse chalybeous line on each side in front and with four elongated chalybeous spots hindward, the outer pair near the base of the fore-wings; scutellum shining on the hind border; abdomen with a white shining transverse mark on each side at the base, and with two large yellow spots on each side; tibiæ piceous; wings limpid, blackish at the base; veins black.

Length of the body 4½ lines; of the wings 8½ lines.

Mexico.

Eristalis expictus.

Mas.—Niger, capite albo, callo, antennis pedibusque nigris, thorace fasciâ anticâ interruptâ testaceâ, scutello flavo, abdomine flavo lineâ transversâ basali vittâque angulosâ nigris, tibiis tarsisque posterioribus basi genubusque testaceis, alis limpidis basi nigricantibus.

Male.—Black: head in front white and shining, except the black shining callus; antennæ and legs black; thorax in front with a testaceous band, which is widely interrupted in the middle and somewhat dilated on each side; scutellum yellow; abdomen yellow, with a black transverse line at the base and a black stripe, which is dilated on the hind border of each segment and at the tip; posterior tibiæ and tarsi towards the base and knees testaceous; wings limpid, blackish at the base; veins black.

Length of the body 4 lines; of the wings 8 lines.

Mexico.

Eristalis basiger.

Fœm.—Fulvus, capite testaceo, thorace vittis tribus anticis duabusque posticis lineisque duabus transversis testaceis, scutelli margine testaceo, abdominis basi testaceâ maculam transversam fuscam includente, segmentorum marginibus posticis testaceis, alis limpidis vittâ anticâ fuscâ.

Female.—Tawny: head with a testaceous shining stripe on each

side between the eyes; underside testaceous; thorax in front with three testaceous stripes, and on each side with a transverse testaceous line which joins the lateral stripe; hind part of the thorax with a stripe on each side and the border of the scutellum testaceous; hind borders of the abdominal segments testaceous; base testaceous, including a transverse brown spot; wings limpid, with a brown front stripe, which is sub-costal for more than half the length, costal from thence almost to the tips.

Length of the body 4 lines; of the wings $8\frac{1}{2}$ lines.

Amazon Region.

Eristalis involvens.

Fœm.—Niger, nitens, thorace cinereo obscuro vittis quatuor nigris, alis cinereis strigâ transversâ mediâ nigrâ, alulis sordide albidis margine obscuriore.

Female.—Cinereous, dull: head, antennæ, scutellum, abdomen and legs black, shining; thorax with four black stripes, the interior stripes more slender than the outer and united hindward; wings grey, with a black streak in the middle across the fore half; veins black; alulæ dingy whitish, with darker borders.

Length of the body $3\frac{1}{2}$ lines; of the wings 8 lines.

Genus Xylota, Meig.

Xylota subcostalis.

Fœm.—Nigra, nitens, capite pectoreque cinereis, thorace vittis quatuor cinereis, pilis lateralibus sub-auratis, abdomine lanceolato, genubus ferrugineis, femoribus posticis crassis, tibiis posticis arcuatis, alis sub-cinereis vittâ anticâ nigrâ, halteribus albidis.

Female.—Black, shining: head with cinereous tomentum on each side in front; antennæ seated on a tubercle; third joint elongate-conical, as long as the first and the second together; thorax with four cinereous stripes, and on each side with slightly gilded hairs; pectus cinereous; abdomen lanceolate; knees ferruginous; hind femora thick; hind tibiæ curved; wings greyish, with a black stripe which is sub-costal for full half the length, and costal from thence nearly to the tip; veins black; halteres whitish.

Length of the body 5 lines; of the wings 8 lines.

Mexico.

Genus Volucella, Geoffr.

Volucella aperta.

Mas.—Picea, nitens, capite fulvo maculâ frontali piceâ, antennis ferrugineis, thorace vittis duabus lateralibus fulvis valde indistinctis, scutello fulvo, abdomine testaceo apice nigro, alis cinereis, venulis transversis mediis nebulosis.

Male.—Piceous, shining: head tawny, with a piceous spot on the front; epistoma very prominent; antennæ ferruginous, seated on a small tubercle, which is beset with short black bristles; thorax with a very indistinct tawny stripe on each side; scutellum tawny; abdomen testaceous, black towards the tip; legs tawny; tarsi black towards the tips; wings grey; veins black; transverse veinlets in the middle somewhat clouded.

Length of the body $5\frac{1}{2}$ lines; of the wings 12 lines.

Mexico.

Genus Temnocera, St. Farg. et Serv.

Temnocera viridula.

Mas.—Testaceo-viridis, nitens, antennis testaceis, thorace maculis duabus magnis (unâ anticâ, alterâ posticâ) nigricantibus, scutello abdominisque segmentis viridibus, nigro-marginatis, tibiis tarsisque nigris, alis sub-cinereis, guttâ costali nigrâ.

Male.—Testaceous-green, shining: antennæ testaceous; thorax with a large blackish spot in front and another on the hind border; scutellum green, its hind border and the metathorax black; abdomen green, its segments with black borders; tibiæ and tarsi black; wings greyish, a little darker exteriorly; a black dot on the costa beyond the middle; veins black.

Length of the body 4 lines; of the wings 8 lines.

Mexico.

Temnocera unilecta.

Fœm.—Nigra, nitens, non lata, antennis piceo-nigris, thorace nigricante cupreo, tarsis posterioribus basi ferrugineis, alis cinereo-fuscis basi pallidioribus, venulis transversis nigro-nebulosis, halteribus apice niveis.

Female.—Black, shining, not broad: epistoma very prominent; antennæ piceous-black; thorax blackish-cupreous; posterior tarsi ferruginous at the base; wings cinereous-brown, paler towards the base; veins black; transverse veinlets clouded with black; halteres with white knobs.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

Genus Syrphus, Fabr.

Syrphus colludens.

Fœm.—Niger, sat gracilis, capite lato nitente antice testaceo, fronte nigro-vittatâ, antennis ferrugineis, thorace vittis duabus lateralibus interruptis flavis, scutello pallide luteo, abdomine lineari fasciis quatuor excavatis (1ª interrupta) pallide luteis, guttis duabus basalibus flavis, segmentis chalybeo-marginatis, femoribus tibiisque anterioribus testaceis, alis subcinereis angustis.

Female.—Black, rather slender: head broad, shining, testaceous in front and beneath; front with a black stripe; antennæ ferruginous; thorax with a yellow interrupted stripe on each side; scutellum pale luteous; abdomen linear, with four pale luteous bands; first band interrupted; second, third and fourth excavated on the hind side; hind borders of the segments chalybeous, a yellow dot on each side at the base; anterior femora and tibiæ testaceous, the former black at the base; wings greyish, narrow; veins black.

Length of the body 4 lines; of the wings 8 lines.

Mexico.

Fam. CONOPIDÆ.

Genus Conops, Linn.

Conops bipunctata?

Fœm.—Ferruginea, argenteo-tomentosa, capite guttis duabus nigris, abdomine sub-clavato basi supra nigricante, tibiis tarsisque nigris, alis obscure cinereis, halteribus testaceis.

Conops bipunctatus? Loew, Bericht Verhandl. Kön. Preuss. Akad. Wissensch. Berl. 1852, 659, 18. *Female.*—Ferruginous, with silvery tomentum: head with a black dot on each side between the eyes; third joint of the antennæ lanceolate, with a short apical seta; abdomen gradually deepening from the base to the tip, blackish above towards the base; tibiæ and tarsi black; wings dark grey; veins black; halteres testaceous.

Length of the body 6 lines; of the wings 9 lines.

Loew's description is from a Mozambique specimen, and differs somewhat from the character of the insect here described.

The above author, in the "Archiv für Naturgeschichte (1857)," page 137, divides Africa into seven entomological districts; the first with Egypt, Nubia and Abyssinia; the second, or the whole northern coast from Tripolis to Morocco; the third, or the Western

Islands; the fourth, or the west coast from Senegambia to Benguela; the fifth, or the coast from the Cape eastward; the sixth, or the Eastern Islands; the seventh from Mozambique to Bab-el-Mandeb. He reckons the number of Dipterous species therein to be as follows:—

North-east district	200	species.
North coast	300	,,
Western Islands	180	,,
West coast	200	,,
South coast	500	,,
Eastern Islands	100	,,
East coast	50	,,
Total	1,530	species.

He describes the following species of *Stratiomidæ*, all new with the exception of the first, the eighth and the fourteenth, which last may prove to be identical with *Ptilocera Natalensis*.

SARGINA.

1. *Plecticus elongatus*, Guinea, Cape, Caffraria.
   Musca elongata, Fabr.
   Sargus posticus, Wied.
2. *Chrysonotus flavomarginatus*, Mauritius.
3. *Chrysomyia bella*, Cape.
4. *Microchrysa circumscripta*, Caffraria.
5. ,, *scutellaris*, Caffraria.

ODONTOMYINA.

6. *Odontomyia quadrinotata*, Mozambique.
7. ,, *adusta*, Caffraria.
8. ,, *frontalis* (Macq.), Cape.
9. *Nemotelus dissimilis*, Caffraria.
10. ,, *hæmorrhous*, Caffraria.
11. *Oxycera nubifera*, Caffraria.
12. *Ephippium maculipenne*, Guinea.

PACHYGASTRINA.

13. *Sternobrithes* (n. g.) *tumidus*, Guinea, Caffraria.
14. *Ptilocera quadrilineata*, Sierra Leone, Caffraria.
    Stratiomys quadrilineata, Fabr.

Fam. MUSCIDÆ.

Div. CALYPTERÆ.

Sub-fam. TACHINIDES.

Genus ECHINOMYIA, Dumeril.

Echinomyia ludens.

Fœm.—Testacea, nigro-setosa, capite albo supra sub-aurato, antennis fulvis, articulo 3° elongato apice nigro-truncato, thorace sub-aurato vittis quatuor fuscescentibus, abdominis apice nigro, pedibus fulvis, tarsis apice nigricantibus, alis cinereis, alulis lurido-cinereis, halteribus testaceis.

Female.—Testaceous, with stout black bristles: head slightly gilded above; white in front and beneath; epistoma prominent; proboscis black; antennæ tawny; third joint longer than the second, increasing in breadth towards the tip, which is black and truncated; arista black, stout; thorax slightly gilded, with four brownish stripes; abdomen black at the tip; legs tawny; tarsi blackish towards the tips; wings grey; veins black, tawny at the base; præbrachial vein forming a right angle at its flexure, near which it is curved, and is thence straight to its tip; discal transverse vein hardly curved outward, parted by a little less than its length from the border and by much less than its length from the flexure of the præbrachial; alulæ cinereous, with a lurid tinge; halteres testaceous.

Length of the body 5 lines; of the wings 10 lines.

Brazil.

Echinomyia albiceps.

Mas.—Nigra, cinereo-tomentosa nigro-setosa, capite argenteo, frontalibus fulvis, palpis testaceis, antennis nigris ex parte ferrugineis, articulis 2° et 3° æqualibus, hoc valde convexo, thorace subvittato, scutello sub-ferrugineo, abdomine ferrugineo-piceo, alis cinereis, alulis albido-cinereis.

Male.—Black, with cinereous tomentum and black bristles: head silvery-white in front and beneath; frontalia tawny, widening in front; epistoma slightly prominent; proboscis shining; palpi testaceous, rather long and slender; antennæ black, partly ferruginous; third joint very convex above, as long as the second; thorax indistinctly striped; scutellum somewhat ferruginous; abdomen ferruginous-piceous, shining, a little broader but hardly longer than the thorax; legs black; wings grey; veins black, testaceous at the base; præbrachial vein forming a hardly obtuse

angle at its base, near which it is slightly curved inward, and is thence straight to its tip; discal transverse vein nearly straight, parted by a little less than its length from the border, and by hardly more than half its length from the flexure of the præbrachial; alulæ whitish cinereous.

Length of the body 5 lines; of the wings 10 lines.

Brazil.

Genus Jurinia, Desvoidy.

Jurinia debitrix.

Fœm.—Nigra, nigro-setosa, capite testaceo, frontalibus ferrugineis, palpis testaceis, antennis piceo-nigris, articulis 2° et 3° sub-æqualibus, thorace cinereo vittis vix conspicuis nigris, lateribus scutelloque ferrugineis, abdomine ferrugineo spinis plurimis nigris armato, alis angustis fuscescente cinereis, basi fulvis.

Female.—Black, with numerous black bristles: head testaceous in front and beneath; frontalia ferruginous; epistoma very prominent, with a few black bristles on each side; palpi testaceous; antennæ piceous-black; third joint elongate, oval, as long as the second; arista much longer than the third joint; thorax with cinereous tomentum, and with very indistinct black stripes, its sides and the scutellum dark ferruginous; abdomen dark ferruginous, much broader than the thorax, very thickly beset with black spines; legs bristly; wings narrow, brownish cinereous, tawny at the base; veins black, mostly tawny towards the base; præbrachial vein forming a right well-defined angle, with the usual inward curve, and thence nearly straight to its tip, which is at some distance in front of the tip of the wing; discal transverse vein long, oblique, hardly undulating, parted by much less than its length from the border, and from the flexure of the præbrachial; alulæ dark cinereous.

Length of the body 6 lines; of the wings 13 lines.

Mexico.

Jurinia innovata.

Fœm.—Nigro-cyanea, setosa, valida, capite æneo-viridi albo-tomentoso, frontalibus atris, palpis antennisque nigris, horum articulo 3° basi ferrugineo, aristæ dimidio basali robusto, abdomine spinis duabus mediis plurimisque apicalibus, pedibus nigris, alis obscure cinereis guttâ basali nigricante, venâ transversâ præbrachiali nigro-nebulosâ, alulis nigricantibus.

Female.—Dark blue, bristly, stout: head æneous green, white

in front and beneath; frontalia deep black, widening in front; facialia without bristles; epistoma hardly prominent; palpi black; antennæ black, not reaching the epistoma; third joint ferruginous at the base, convex above, rounded at the tip, a little longer than the second; arista stout for nearly half its length; scutellum with very long stout bristles; abdomen with two spines in the middle and many towards the tip; legs stout, black; wings dark grey, with a blackish spot near the base; veins black; præbrachial transverse vein clouded with black; præbrachial vein forming a right angle, very slightly curved from thence to its tip, which is somewhat in front of the tip of the wing; discal transverse vein hardly undulating, parted by a little less than its length from the border, and by hardly more than half its length from the flexure of the præbrachial; alulæ blackish.

Length of the body 4½ lines; of the wings 9 lines.

Mexico.

Genus Nemoræa, Desv.

Nemoræa intrita.

Fœm.—Nigra, robusta, pilosa, capite albido-testaceo, frontalibus piceis, palpis fulvis clavatis, antennarum articulo 3° obtuso, aristâ validâ, thorace cinereo non vittato, abdomine nitente, alis obscure cinereis, venâ præbrachiali angulum rectum fingente, venâ transversâ discali subrectâ, alulis nigricantibus.

Female.—Black, stout, pilose: head whitish testaceous, cinereous above; frontalia piceous; facialia without bristles; epistoma rather prominent; palpi tawny, clavate; antennæ nearly extending to the epistoma; third joint obtuse at the tip, a little longer and broader than the second; arista stout, gradually tapering, very much longer than the third joint; thorax with cinereous tomentum, not striped; scutellum with very long bristles; abdomen shining, spinose towards the tip; wings dark grey, blackish towards the base; veins black; præbrachial vein forming a right angle at its flexure, near which it is slightly curved, and is thence straight to its tip, which is at some distance in front of the tip of the wing; discal transverse vein nearly straight, parted by much less than its length from the border, and by little more than half its length from the flexure of the præbrachial; alulæ blackish.

Length of the body 5 lines; of the wings 10 lines.

Mexico.

Nemoræa erythropus.

Fœm.—Nigra, robusta, cinereo-tomentosa, capite albido, frontalibus nigris, facialibus et epistomate testaceis, antennis rufis, articulo 3° nigro longissimo, thorace vittis quatuor nigris, abdomine cyanescente-nigro cinereo-tessellato subtus rufescente, pedibus rufescente fulvis, tarsis nigris, alis sub-cinereis, alulis cinereis.

Female.—Black, stout, with cinereous tomentum: head whitish in front and beneath; frontalia black, linear, the bristles on each side extending to half the length of the face; facialia testaceous, without bristles; epistoma testaceous, not prominent; antennæ nearly reaching the epistoma; first and second joints red; third linear, black, about four times the length of the second; arista stout for nearly half the length from the base; thorax with four black stripes; abdomen bluish-black, tesselated with cinereous; underside reddish, except at the tip; legs reddish, tawny; tarsi black; wings greyish; veins black, testaceous towards the base and along the costa; præbrachial vein forming a rounded and slightly obtuse angle at its flexure, near which it is hardly curved, and is thence straight to its tip; discal transverse vein slightly curved inward, parted by less than its length from the flexure of the præbrachial, and by much less than its length from the border; alulæ cinereous.

Length of the body 4 lines; of the wings 8 lines.

Tasmania.

Genus Eurigaster, Macq.

Eurigaster saginata.

Fœm.—Nigra, valida, sub-cylindrica, capite albo, frontalibus latis ferrugineis, palpis fulvis, antennarum articulo 3° clavato truncato basi ferrugineo, aristâ validâ, thoracis vittis tribus lateribus pectoreque cinereis, abdominis segmentis cinereo late fasciatis, pedibus validis setosis, alis sub-cinereis basi obscurioribus, venâ præbrachiali angulum rectum fingente, venâ transversâ discali sub-rectâ, alulis albidis.

Female.—Black, stout, nearly cylindrical: head white, excepting the vertex, which is black, and with stout bristles; frontalia broad, ferruginous, hardly widening in front; facialia without bristles; epistoma prominent; palpi tawny; antennæ just reaching the epistoma; third joint ferruginous at the base, widening to the tip, which is truncated; arista stout; thorax with three cinereous

stripes; sides and pectus cinereous; abdomen longer than the thorax, with a broad cinereous band on the fore-border of each segment; two spines on the disk and a few towards the tip; legs stout, setose; wings greyish, a little darker at the base and along the costa; veins black; præbrachial vein forming a right angle at its flexure, hardly curved from thence to its tip, which is much in front of the tip of the wing; discal transverse vein almost straight, parted by much more than half its length from the border, and by a little more than half its length from the flexure of the præbrachial; alulæ whitish.

Length of the body 5 lines; of the wings 8 lines.

Mexico.

Eurigaster desita.

Fœm.—Nigra, robusta, setosa, cinereo-tomentosa, capite argenteo, frontalibus piceis, palpis fulvis, antennarum articulo 3° longissimo, abdominis apice aurato, pedibus validis, alis alulisque nigro-cinereis.

Female.—Black, stout, setose, slightly covered with cinereous tomentum: head silvery-white, with the exception of the vertex; frontalia piceous; facialia bristly along most of the length; palpi tawny; antennæ extending to the epistoma, which is very slightly prominent; third joint six times longer than the second; arista stout, slightly tapering, a little longer than the third joint; scutellum with many long stout bristles; abdomen pale, gilded at the tip; legs stout; wings and alulæ blackish-grey; veins black; præbrachial vein forming a right angle at its flexure, slightly curved from thence to its tip, which is at a little in front of the tip of the wing; discal transverse vein forming an obtuse angle near its base, straight from thence to its tip, parted by half its length from the border, and from the flexure of the præbrachial.

Length of the body $4\frac{1}{2}$ lines; of the wings $8\frac{1}{2}$ lines.

Mexico.

Eurigaster commetans.

Fœm.—Nigra, robusta, capite aurato, frontalibus atris, palpis fulvis, antennarum articulo 2° rufescente, 3° longo apice rotundato, aristæ triente basali valido, thorace sub-aurato vittis quinque nigris, pectore cinereo, abdomine sub-aurato, basi et segmentorum marginibus nigris, alis cinereis, costâ strigisque apud venas obscurioribus, venâ præbrachiali angulum obtusum fingente, venâ discali transversâ angulum obtusum fingente, alulis obscure cinereis.

Female.—Black, stout, slightly setose: head gilded, paler be-

neath; frontalia deep black, widening much in front; facialia without bristles; epistoma hardly prominent; palpi tawny; antennæ not reaching the epistoma; second joint reddish; third linear, rounded at the tip, full four times the length of the second; arista stout for about one-third of its length, rather longer than the third joint; thorax slightly gilded, brighter along each side, with five black stripes; pectus cinereous; abdomen very slightly gilded, black at the base and beneath and along the hind borders of the segments; wings grey, darker along the costa for two-thirds of the length, and with some dark streaks along the black veins; præbrachial vein forming an obtuse angle at its flexure, very slightly curved inward from thence to its tip, which is at a little in front of the tip of the wing; discal transverse vein forming an obtuse angle at one-third of its length, parted by more than half its length from the border and from the flexure of the præbrachial; alulæ dark cinereous.

Length of the body 4½ lines; of the wings 9 lines.

Mexico.

Eurigaster fertoria.

Fœm.—Nigra, valida, capite aurato, frontalibus atris, antennarum articulo 3° longo, aristæ triente basali robusto, thorace subaurato, vittis quatuor nigris, pectore cinereo, abdomine ovato, segmentis cinereo-fasciatis, alis sub-cinereis basi obscurioribus, venâ præbrachiali angulum perobtusum subrotundatum fingente, venâ discali transversâ intus subarcuatâ: alulis sordide albidis.

Female—Black, stout: head gilded; frontalia deep black, widening in front; facialia without bristles except towards the frontalia; epistoma not prominent; antennæ nearly reaching the epistoma; third joint linear, slender, about four times the length of the second; arista very much longer than the third joint, stout for about one-third of its length; thorax slightly gilded, with four black stripes; pectus cinereous; abdomen oval, with a broad cinereous band on the fore border of each segment; legs with rather small bristles; wings slightly greyish, darker at the base; veins black; præbrachial vein forming a very obtuse and somewhat rounded angle at its flexure, very slightly curved inward from thence to its tip, which is at a little in front of the tip of the wing; discal transverse vein straight, excepting an inward curve near its hind end, parted by a little less than its length from the border and from the flexure of the præbrachial; alulæ dingy whitish.

Length of the body 4 lines; of the wings 7½ lines.

Mexico.

Eurigaster postica.

Fœm.—Nigra, lata, capite albido, frontalibus atris, antennarum articulo 3° longo, aristæ dimidio basali valido, thorace cinereo vittis quatuor nigris, scutello postico rufescente, abdomine ovato, lateribus rufescentibus, segmentis cinereo-fasciatis, alis sub-cinereis, basi obscurioribus, venâ præbrachiali angustum sub-obtusum fingente, venâ discali transversâ intus vix arcuatâ, alulis albis.

Female.—Black, broad: head whitish; frontalia deep black, slightly widening in front, beset with bristles which extend along one-third of the facialia; epistoma not prominent; antennæ almost reaching the epistoma; third joint linear, about four times the length of the second; arista stout for half the length, very much longer than the third joint; thorax with cinereous tomentum, and with four slight black stripes; scutellum reddish hindward; abdomen oval, reddish on each side, with a broad irregular cinereous band on the fore border of each segment; wings greyish, darker at the base; veins black; præbrachial vein forming a very slightly obtuse angle at its flexure, near which it is very slightly curved inward, and is thence straight to its tip, which is rather far in front of the tip of the wing; discal transverse vein hardly curved inward near its hind end, parted by hardly more than half its length from the border, and by somewhat less than its length from the flexure of the præbrachial; alulæ white.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

Eurigaster habilis.

Fœm.—Nigra, robusta, cinereo-tomentosa, capite albido, frontalibus atris antice latescentibus, palpis fulvis, antennis epistoma attingentibus, thorace vittis quatuor indistinctis nigris, scutello et abdominis lateribus ferrugineis, pedibus validis, alis cinereis, venâ præbrachiali angulum sub-obtusum sub-rotundatum fingente intus apicem versus valdè arcuatâ, venâ transversâ discali rectâ, alulis sordide albidis.

Female.—Black, stout, with cinereous tomentum: head whitish; frontalia deep black, widening in front; facialia with a few bristles towards the frontalia; epistoma not prominent; palpi tawny; antennæ reaching the epistoma; 3rd joint about four times the length of the 2nd; arista slender, more stout towards the base, very much longer than the 3rd joint; thorax with four indistinct black stripes; scutellum and sides of the abdomen ferruginous; legs stout; wings grey; veins black; præbrachial vein forming a

slightly obtuse and somewhat rounded angle at its flexure, much curved inward from thence to its tip, which is at some distance in front of the tip of the wing; discal transverse vein straight, parted by somewhat less than its length from the border and from the flexure of the præbrachial; alulæ dingy whitish.

Length of the body 3 lines; of the wings 6 lines.

Mexico.

Genus Masicera, Macq.

Masicera disputans.

Mas.—Nigra, gracilis, setosa, capite albo, frontalibus perangustis, palpis ferrugineis, antennarum articulo 3° longo gracili, aristâ tenui, thorace cinereo vittis duabus angustis nigris, pectore albido, abdomine tenuissimo, segmentis albido-fasciatis, lateribus basi sub-rufescentibus, pedibus longiusculis, alis obscure cinereis apud costam nigricantibus, venâ præbrachiali angulum perobtusum fingente, venâ discali transversâ sub-undulatâ.

Male.—Black, slender, bristly: head white; vertex black; front prominent; frontalia very narrow, widening in front; facialia without bristles; epistoma not prominent; palpi ferruginous; antennæ almost reaching the epistoma; third joint slender, linear, rounded at the tip, about four times the length of the second; arista very slender, except near the base, nearly twice the length of the third joint; thorax cinereous, with two slender black stripes; pectus whitish; abdomen very slender, with a whitish band on the fore border of each segment; slightly reddish on each side towards the base; legs rather long and slender; wings dark grey, blackish along the costa; veins black; præbrachial vein forming a very obtuse angle at its flexure, straight from thence to its tip, which is at a little in front of the tip of the wing; discal transverse vein slightly undulating, parted by much less than its length from the border and by a little less than its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body 3½ lines; of the wings 6 lines.

Mexico.

Masicera gentica.

Mas.—Nigra, gracilis, capite albido, frontalibus atris, antennarum articulo 3° longo apice obtuso, aristâ gracili, thorace cinereo vittis quatuor nigris, abdominis segmentis cinereo-fasciatis, pedibus longiusculis, alis cinereis, venâ præbrachiali

angulum perobtusum sub-rotundatum fingente, venâ discali transversâ intus arcuatâ, alulis albidis.

Male.—Black, slender, bristly: head whitish; frontalia deep black, narrow; facialia without bristles; epistoma not prominent; antennæ reaching the epistoma; third joint slender, linear, somewhat obtuse at the tip, more than four times the length of the second; arista very slender, stout for about one-fifth of the length, very much longer than the third joint; thorax cinereous, with four distinct black stripes; abdomen longer than the thorax, with a broad complete cinereous band on the fore border of each segment; apical half with long slender spines; legs rather long; wings grey; veins black; præbrachial vein forming a very obtuse and somewhat rounded angle at its flexure, almost straight from thence to its tip, which is somewhat in front of the tip of the wing; discal transverse vein curved inward near its hind end, parted by much less than its length from the border, and by a little less than its length from the flexure of the præbrachial; alulæ whitish, large.

Length of the body 3½ lines; of the wings 7 lines.

Mexico.

Masicera necopina.

Fœm.—Nigra, sat gracilis, capite albido, frontalibus atris, antennarum articulo 3° longo, apice rotundato, aristâ gracili, thorace albido vittis quatuor nigris, abdomine ovato, segmentis albido-fasciatis, apice rufescente, alis cinereis basi nigricantibus, venâ præbrachiali angulum sub-obtusum fingente, verâ transversâ discali undulatâ, alulis albis.

Female.—Black, rather slender; head white; vertex cinereous; frontalia deep black, linear; facialia without bristles; epistoma not prominent; antennæ reaching the epistoma; third joint more than four times the length of the second, slightly widening from the base to the tip, which is rounded; arista slender along the whole length, much longer than the third joint; thorax and pectus whitish, the former with four black stripes; abdomen oval, with a whitish band on the fore border of each segment; tip reddish, with some black spines; wings grey, blackish towards the base; veins black; præbrachial vein forming a very slightly obtuse angle at its flexure, very slightly curved inward from thence to its tip, which is at somewhat in front of the tip of the wing; discal transverse vein undulating, parted by less than its length from the border and from the flexure of the præbrachial; alulæ white.

Length of the body 3 lines; of the wings 5 lines.

Mexico.

Masicera expergita.

Mas.—Nigra, gracilis, capite albo, frontalibus angustis atris, antennarum articulo 3° longo, aristâ gracili, thorace subcinereo, abdomine cylindrico maculis lateralibus albis, alis nigricante cinereis, venâ præbrachiali angulum perobtusum fingente, venâ transversâ discali rectâ.

Male.—Black, slender: head white; frontalia narrow, deep black; facialia without bristles; epistoma not prominent; antennæ nearly reaching the epistoma; third joint slender, linear, about four times the length of the second; arista slender, stout at the base, very much longer than the third joint; thorax slightly cinereous; abdomen cylindrical, longer and a little narrower than the thorax, bristly except towards the base, with white spots along each side; legs slender; wings blackish-grey; præbrachial vein forming a very obtuse angle at its flexure, hardly curved from thence to its tip, which is very little in front of the tip of the wing; discal transverse vein straight, parted by much less than its length from the border, and by very much more than its length from the flexure, of the præbrachial; alulæ large, whitish.

Length of the body 2½ lines; of the wings 4½ lines.

Mexico.

Masicera alacris.

Fœm.—Nigra, cinereo-tomentosa, capite albo, frontalibus nigris, antennarum articulo 2° rufescente, 3° longissimo, thorace lineis quatuor nigris, abdomine ovato sub-tessellato, segmentorum marginibus posticis nigris, alis cinereis, alulis albido-cinereis.

Female.—Black, with cinereous tomentum: head shining white in front and beneath; frontalia black, narrow, linear, with lateral bristles, which do not extend along the face; facialia without bristles; epistoma not prominent; eyes bare; antennæ nearly reaching the epistoma; second joint reddish; third linear, about four times the length of the second; arista stout for about one-fourth of the length from the base; thorax with four slender black lines; abdomen oval, slightly tessellated, not longer than the thorax; hind borders of the segments black; wings grey; veins black; præbrachial vein forming a very obtuse angle at its flexure, straight from thence to its tip; discal transverse vein undulating, parted by less than its length from the flexure of the præbrachial, and by much less than its length from the border; alulæ whitish-cinereous.

Length of the body 3 lines; of the wings 6 lines.

Brazil.

Masicera incivica.

Mas et *Fœm.*—Nigra, nigro-setosa, capite albido, antennarum articulo 3° longissimo epistoma attingente, abdomine æneo-nigro fasciis interruptis albidis, alis cinereis apud costam obscurioribus, venâ transversâ præbrachiali nigro-nebulosâ.

Male and *Female.*—Black, with stout black bristles: head whitish in front; bristles descending from the frontalia to half the length of the face; epistoma not prominent; antennæ extending to the epistoma; third joint four times the length of the second; arista stout for about one third of its length; thorax not striped; abdomen æneous black, with a whitish interrupted band on the fore-border of each segment; wings grey, darker along the costa; veins black; præbrachial vein forming an obtuse angle, curved from thence to its tip, which is hardly in front of the tip of the wing; præbrachial transverse vein clouded with black; discal transverse vein straight, parted by a little more than its length from the flexure of the præbrachial, and by much less than its length from the border; alulæ dark cinereous.

Length of the body 4 lines; of the wings 8 lines.

Hindostan?

Genus Lydella, Macq.

Lydella cessatrix.

Fœm.—Nigra, gracilis, capite albo, frontalibus rufescentibus, antennis rufescentibus, articulo 3° clavato obtuso, thorace cinereo vittis tribus angustis indistinctis nigris, abdomine nitente, segmentis cinereo-fasciatis, apice rufescente, alis cinereis, venis transversis subnebulosis, venâ præbrachiali angulum vix acutum fingente, venâ transversâ discali extus vix arcuatâ, alulis albidis.

Female.—Black, slender: head white, excepting the vertex; frontalia reddish, widening in front; facialia without bristles; epistoma prominent; antennæ reddish, reaching the epistoma; second joint rather long; third widening much from the base to the tip, which is obtuse, about twice the length of the second joint; arista rather slender, very much longer than the third joint; thorax cinereous, with three slender indistinct black stripes; abdomen shining, with a cinereous band on the fore-border of each segment, with two black spines in the disk, and with several towards the tip, which is reddish; wings grey; veins black; transverse veins slightly clouded; præbrachial vein forming a hardly acute angle at its flexure, curved inward from

thence to its tip, which is far in front of the tip of the wing; discal transverse vein hardly curved outward, parted by about its length from the border, and by less than its length from the flexure, of the præbrachial; alulæ whitish.

This species differs much, in the structure of the third joint of the antennæ, from the typical form of *Lydella*.

Length of the body $3\frac{1}{4}$ lines; of the wings 6 lines.

Mexico.

Lydella? indita.

Fœm.—Nigra, gracilis, cylindrica, sub-setosa, capite albo, frontalibus atris antice latescentibus, facie valde obliquâ, palpis gracillimis, antennis epistoma vix attingentibus, articulo 3° lineari, thorace cinereo vittis quatuor indistinctis nigris, abdomine cinereo sub-tessellato, pedibus longiusculis, alis nigricante cinereis basi et costâ interiore pallide luteis, margine postico sub-cinereo, venâ præbrachiali angulum obtusum fingente, venâ discali transversâ sub-undulatâ, alulis albis magnis.

Female.—Black, slender, cylindrical, slightly bristly: head white; frontalia deep black, widening much in front; face very oblique; facialia without bristles; epistoma slightly prominent; palpi very slender; antennæ nearly reaching the epistoma; third joint linear, rounded at the tip, about thrice the length of the second; arista slender, stout at the base, very much longer than the third joint; thorax cinereous, with four indistinct black stripes; abdomen much longer than the thorax, slightly tessellated with cinereous, with some black spines in the disk and more towards the tip; legs rather long; wings blackish grey, pale luteous at the base and along half of the costa, slightly greyish along the hind border; præbrachial vein forming an obtuse angle at its flexure, near which it is very slightly bent inward, and is thence straight to its tip, which is somewhat in front of the tip of the wing; discal transverse vein slightly undulating, parted by half its length from the border and by much more than half its length from the flexure of the præbrachial; alulæ white, large.

Length of the body $5\frac{1}{2}$ lines; of the wings 9 lines.

Mexico.

Genus Tachina, Fabr.

Tachina despicienda.

Cinerea, setosa, capite albo sub-depresso, frontalibus nigris, antennis breviusculis, articulo 2° ferrugineo, abdomine fasciis

nigricantibus, pedibus nigris, alis cinereis, venis nigris, alulis albis, halteribus testaceis.

Cinereous, setose: head white, somewhat depressed above; frontalia black; face oblique; antennæ not near reaching the epistoma; second joint ferruginous; third about twice the length of the second; abdomen with blackish bands on the hind borders of the segments; legs black; wings grey; veins black; præbrachial vein forming an obtuse angle at its flexure, joining the cubital vein at a little in front of the tip of the wing; discal transverse vein oblique, almost straight, parted by a little less than its length from the border, and by much more than its length from the præbrachial transverse vein; alulæ white; halteres testaceous.

Length of the body 2½ lines; of the wings 4 lines.

New South Wales.

Sub-Fam. DEXIDES.

Genus Dexia, Meig.

Dexia pertecta.

Nas.—Cinerea, capite albo, frontalibus atris, proboscide longo nigro geniculato, palpis fulvis, antennarum articulo 2° rufo, aristâ nudâ, thorace vittis angustis indistinctis nigris, abdomine lanceolato, maculis dorsalibus trigonis nigris, pedibus testaceis longis, tibiis posticis tarsisque nigris, alis cinereis longis angustis, costâ venisque fuscescente nebulosis, venâ præbrachiali angulum perobtusum fingente, venâ discali transversâ undulatâ.

Male.—Cinereous: head white, vertex cinereous in some aspects; frontalia deep black, widening slightly in front; epistoma rather prominent; proboscis long, black, geniculated; palpi slender, tawny; antennæ black, not reaching the epistoma; second joint red; third slender, linear, more than twice the length of the second; arista slender, tapering, nearly twice the length of the third joint; thorax with slender indistinct black stripes; abdomen lanceolate, much longer than the thorax, with a black triangular spot on each segment, and with a few black spines towards the tip; legs testaceous, long, slender; tibiæ darker than the femora; tarsi and hind tibiæ black; wings cinereous, narrow, very long, brownish in front and along the veins; veins black, testaceous at the base; præbrachial vein forming a very obtuse angle at its flexure, hardly curved from thence to its tip, which is hardly in front of the tip of the wing; discal transverse vein undulating,

parted by much less than half its length from the border and by a little less than its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body 5 lines; of the wings 12 lines.

Mexico.

Sub-Fam. SARCOPHAGIDES.

Genus Sarcophaga, Meig.

Sarcophaga intermutans.

Fœm.—Cinerea, valida, capite albido, frontalibus nigris linearibus, thorace vittis tribus latiusculis mediis vittisque duabus lateralibus angustioribus nigris, abdomine sub-tessellato apice fulvo, pedibus nigris robustis, alis cinereis.

Female.—Cinereous, stout: head white; frontalia black, linear; epistoma rather prominent; thorax with three black, regular, rather broad stripes, and with two more slender lateral black stripes; abdomen broader than the thorax, slightly tessellated, tawny at the tip; legs black, stout; wings grey; veins black, normal.

Length of the body 5 lines; of the wings 10 lines.

Mexico.

Sarcophaga perneta.

Mas.—Cinerea, sat robusta, capite pallidè aurato, frontalibus atris anticè sublatescentibus, thorace vittis tribus latis nigris, abdomine tessellato, segmentis duobus apicalibus auratis, pedibus nigris validis, alis cinereis.

Male.—Cinereous, rather stout: head pale gilded; frontalia deep black, widening slightly in front; epistoma not prominent; thorax with three regular broad black stripes; abdomen tessellated; two last segments gilded; legs black, stout; wings grey; veins black, normal.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Mexico.

Sarcophaga innota.

Fœm.—Cinerea, sat valida, capite albo, faciei lateribus subauratis, frontalibus atris linearibus, thorace vittis tribus latis cinereo-nigris, abdomine tessellato, pedibus nigris, alis cinereis.

Female.—Cinereous, rather stout: head white, very slightly gilded on each side of the face; frontalia deep black, linear; epistoma not prominent; thorax with three broad black stripes which

are somewhat tinged with cinereous; abdomen tessellated; legs black; wings grey; veins black, normal.

Length of the body 3½ lines; of the wings 7 lines.

Mexico.

Sarcophaga conclausa.

Fœm.—Cinerea, vix robusta, capite aurato facie albidâ, frontalibus atris antice sublatescentibus, thorace vittis tribus atris lateribus subauratis, abdomine tessellato subaurato apice aurato, pedibus nigris validis, alis cinereis, alulis albidis.

Female.—Cinereous, hardly stout: head gilded; hind part and face whitish; frontalia deep black, very slightly widening in front; epistoma not prominent; thorax with three regular black stripes, its sides slightly gilded; abdomen very slightly gilded, very regularly tessellated; last segment gilded; legs black, stout; wings grey; veins black, normal; alulæ whitish.

This may possibly be the female of *S. perneta*, but it can be distinguished from that species by the difference of colour, and by the narrower and more regular stripes of the thorax.

Length of the body 3¼ lines; of the wings 6½ lines.

Mexico.

Sarcophaga despensa.

Fœm.—Cinerea, sat gracilis, capite albido, frontalibus nigris linearibus, thorace vittis tribus latis cinereo-nigris, abdomine e maculis nigris tessellato, pedibus nigris validis, breviusculis, alis cinereis, alulis albis.

Female.—Cinereous, rather slender: head whitish; frontalia black, linear; epistoma not prominent; thorax with three black stripes which have a cinereous tinge; abdomen tessellated with four rows of black spots; legs black, stout, short; wings grey; veins black, normal; alulæ white.

Length of the body 3½ lines; of the wings 6 lines.

Mexico.

Sarcophaga effrenata.

Mas.—Cinerea, vix robusta, capite albo, vertice cinereo, frontalibus nigris antice angustioribus, thorace vittis tribus nigris, abdomine tessellato apice fulvo, pedibus nigris validis, alis cinereis, alulis albidis.

Male.—Cinereous, hardly stout: head white; vertex cinereous; frontalia black, narrower in front; epistoma not prominent; thorax with three black stripes, the middle one narrower than the

other two; abdomen tessellated; tip tawny; legs black, stout; wings grey; veins black, normal; alulæ whitish.

Length of the body 3 lines; of the wings 6 lines.

Mexico.

Sarcophaga fortipes.

Mas.—Atra, robusta, capite albido, frontalibus atris antice latescentibus, palpis subclavatis longiusculis, thorace vittis quatuor albidis interlineatis, abdomine nitente pilosissimo apice rufo, pedibus validis, femoribus tibiisque posterioribus densè ciliatis, alis cinereis basi ex parte nigricantibus, alulis nigricante cinereis.

Male.—Deep black, stout: head whitish, more cinereous on the vertex; frontalia deep black, widening in front; epistoma prominent; palpi subclavate, rather long; thorax with four interlined whitish stripes; abdomen shining, very pilose and with some spines towards the tip, which is red; legs stout; posterior femora and tibiæ densely ciliated; wings grey, partly blackish at the base; veins black, normal; alulæ blackish grey.

Length of the body 7—9 lines; of the wings 13—16 lines.

Haiti.

Sub-Fam. MUSCIDES.

Genus Calliphora, Desv.

Calliphora femorata.

Fœm.—Cyanea, valida, lata, viridi purpureoque varia, vertice nigricante, frontalibus ferrugineis, palpis fulvis, antennis rufescentibus, thorace subcinereo antice viridi, humeris pectore et abdominis basi testaceis, pedibus fulvis, tibiis tarsisque piceis, alis obscure cinereis, costâ basali et apicali fuscâ, venâ præbrachiali angulum obtusum subrotundatum fingente intus apicem versus subarcuatâ, venâ discali transversâ sub-undulatâ, alulis obscurè cinereis.

Female.—Blue, stout, tinged with green and purple: head testaceous, large, prominent in front; vertex blackish; frontalia ferruginous; palpi tawny; antennæ reddish, reaching the epistoma; third joint very long; thorax with slight cinereous tomentum, green in front; humeri, pectus and base of the abdomen testaceous; legs tawny; tibiæ and tarsi piceous; wings dark grey, brown along the costa near the base and also near the tip; veins black; præbrachial vein forming an obtuse and somewhat rounded angle at its flexure, very slightly curved inward from thence to its tip, which is very little in front of the tip of the wing; discal transverse vein undulating, parted by hardly half its length from

the border and by more than half its length from the flexure of the præbrachial; alulæ dark grey.

Length of the body 4 lines; of the wings 8 lines.

Mexico.

Calliphora socors.

Fœm.—Cyaneo-nigra, capite testaceo, vertice nigro, proboscide antennisque fulvis, palpis testaceis clavatis, thorace fasciis cinereis, lateribus pectoreque fulvis, abdomine purpurascente cyaneo, basi fulvo, pedibus fulvis, tarsis nigris, alis cinereis fusco-nebulosis, venâ præbrachiali angulum rotundatum valdè obtusum fingente, venâ discali transversâ subrectâ, alulis cinereis.

Female.—Bluish black: head testaceous, prominent in front; vertex black; proboscis tawny; palpi testaceous, clavate; antennæ tawny, not reaching the epistoma; thorax with bands of cinereous tomentum; sides and pectus tawny; abdomen purplish blue, tawny at the base; legs tawny; tibiæ darker than the femora; tarsi black; wings grey, mostly clouded with brown; præbrachial vein forming a rounded and very obtuse angle at its flexure, which is very near the border, straight from thence to the tip, which is at the tip of the wing; discal transverse vein nearly straight, parted by hardly half its length from the border, and by alittle less than its length from the flexure of the præbrachial; alulæ cinereous.

Length of the body $4\frac{1}{2}$ lines; of the wings 11 lines.

Mexico.

Genus Chrysomyia, Desv.

Chrysomyia inclinata.

Fœm.—Cyanescente viridis, capite anticè fulvo, frontalibus nigris, palpis fulvis, antennis piceis, abdominis basi subtus rufescente, pedibus nigris, alis vitreis, basi et apud costam nigris, venâ præbrachiali angulum rectum benè determinatum fingente, venâ transversâ discali anticè extus subarcuatâ.

Female. Bluish green, shining: head tawny and with white tomentum in front and beneath; frontalia black; palpi tawny; antennæ piceous, extending to the epistoma; abdomen reddish at the base beneath; legs black; wings vitreous, black at the base and along the costa; veins black; præbrachial vein forming a right and well defined angle at its flexure, near which it is much curved inward and is thence straight to its tip; discal transverse vein slightly curved outward near its fore end, parted by hardly

more than half its length from the border and by much more than half its length from the flexure of the præbrachial; alulæ white.

Length of the body 3 lines; of the wings 6 lines.

Natal.

Genus Lucilia Desv.

Lucilia surrepens.

Fœm.—Aureo-viridis, capite albido, frontalibus ferrugineis, epistomatis lateribus, palpis humerisque fulvis, antennis rufescentibus, pedibus nigris, alis vix cinerascentibus, venâ præbrachiali arcuatâ, venâ discali transversâ subundulatâ, alulis albis.

Female.—Golden green: head with whitish tomentum; frontalia ferruginous; epistoma tawny on each side; palpi tawny; antennæ reddish; third joint rather short; humeri tawny; legs black; wings hardly greyish; veins black; præbrachial vein curved at its flexure; discal transverse vein slightly undulating, parted by more than half its length from the border and by not less than its length from the flexure of the præbrachial; alulæ white.

Length of the body 3 lines; of the wings 6 lines.

Mexico.

Lucilia inventrix.

Fœm.—Lætè cyanea, capite albo, frontalibus atris, palpis antennis pedibusque nigris, thoracis lateribus cyaneo-viridibus, abdomine rufo apud discum sub-cyanescente, alis cinereis, venâ præbrachiali arcuatâ, venâ discali transversâ intus vix arcuatâ.

Female.—Bright blue: head white; frontalia deep black; palpi, antennæ and legs black; sides of the thorax bluish green; abdomen red, with a bluish tinge in the disc; wings grey; veins black; præbrachial vein curved at its flexure, ending at a little in front of the tip of the wing; discal transverse vein hardly curved inward, parted by less than its length from the border and by very much more than its length from the flexure of the præbrachial.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Natal.

Genus Pyrellia, Desv.

Pyrellia suspicax.

Mas.—Obscurè purpurascente cyanea, capite nigro, facie anten-

nisque ferrugineis, abdomine viridescente cyaneo, pedibus nigris, alis sub-cinereis, costâ basali nigro-binotatâ, venâ discali transversâ vix arcuatâ, alulis nigricantibus.

Male.—Dark purplish blue, shining: head black; face and antennæ ferruginous; third joint of the antennæ rather short; abdomen greenish blue; legs black; wings slightly greyish, with two black marks on the costa near the base; veins black; discal transverse vein hardly curved, parted by less than half its length from the border and by little less than its length from the flexure of the præbrachial; alulæ blackish.

Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Mexico.

Pyrellia speciosa.

Fœm.—Viridescente cyanea, capite albo, frontalibus palpis pedibusque nigris, antennis pallidè rufescentibus, alis sub-cinereis, venis transversis costâque ex parte fusco-nebulosis, venâ præbrachiali arcuatâ, venâ discali transversâ rectâ, alulis sub-cinereis.

Female.—Greenish blue: head white, except the vertex; frontalia, palpi and legs black; antennæ pale reddish; third joint rather short; wings greyish; transverse veins, costa in front of the præbrachial transverse vein and towards the tip clouded with brown; præbrachial vein forming a curve at its flexure, which is very near the border of the wing; discal transverse vein straight, parted by less than half its length from the border and by more than its length from the flexure of the præbrachial; alulæ greyish.

Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Mexico.

Pyrellia scordalus.

Fœm.—Picea, capite testaceo, frontalibus saturatè rufis, palpis antennisque testaceis, thorace vittis quinque cinereis, pectore pedibusque testaceis, abdomine purpureo basi testaceo, tarsis apice piceis, alis obscurè cinereis, venâ præbrachiali subarcuatâ, venâ discali transversâ sub-undulatâ.

Female.—Piceous: head testaceous, with white tomentum; frontalia deep red; proboscis, palpi and antennæ testaceous; third joint moderately long, reaching the epistoma; thorax with five cinereous stripes; pectus testaceous; abdomen purple, testaceous towards the base; legs testaceous; tarsi piceous towards the tips; wings dark grey; præbrachial vein gently curved at its flexure, which is very near the border, ending at the tip of the wing; discal transverse vein slightly undulating, partly by more than

half its length from the border and by more than its length from the flexure of the præbrachial; alulæ grey.

Length of the body 4 lines; of the wings 9 lines.

Mexico.

Genus Musca, Linn.

Musca sensifera.

Mas.—Nigra, cinereo-tomentosa, capite albo, frontalibus atris anticè latescentibus, palpis antennisque fulvis, thorace vittis tribus nigris, abdomine basi nigro-piceo, fasciis duabus canis, alis cinereis, venis fuscescente nebulosis, venâ præbrachiali angulum rectum fingente, venâ discali transversâ undulatâ.

Male.—Black, with cinereous tomentum: head white; frontalia deep black, widening in front; proboscis, palpi and antennæ tawny; third joint of the antennæ rather short, not reaching the epistoma; thorax with three black stripes; abdomen piceous, black towards the base; second and third segments with hoary bands on the fore borders; wings grey, brownish along the black veins; præbrachial vein forming a well defined right angle at its flexure, slightly curved inward from thence to the tip, which is a little in front of the tip of the wing; discal transverse vein undulating, parted by less than half its length from the border and by more than half its length from the flexure of the præbrachial; alulæ greyish white.

Length of the body $4\frac{1}{2}$ lines; of the wings 10 lines.

Mexico.

Musca perlata.

Fœm.—Obscurè cyanea, setosa, sat gracilis, capite albido, frontalibus obscurè nigris, palpis antennis pedibusque nigris, thoracis vittis quatuor pectoreque albidis, abdomine fasciis duabus latis albidis, apice rufescente, alis sub-cinereis, basi vittâque costali latâ nigris, venâ præbrachiali angulum rectum fingente, venâ discali transversâ subundulatâ.

Female.—Dark blue, bristly, rather slender: head black, with whitish tomentum; frontalia dull black, widening in front; palpi and antennæ black; third joint of the latter slender, reaching the epistoma; thorax with four whitish stripes; pectus whitish; abdomen with two broad whitish bands; tip reddish; legs black; wings greyish, black at the base, and with a broad black costal stripe; præbrachial vein forming a well defined right angle at its flexure, near which it is curved inward, and is thence straight to its tip, which is somewhat in front of the tip of the wing; discal

transverse vein slightly undulating, parted by half its length from the border, and by more than half its length from the flexure of the præbrachial ; alulæ white.

Length of the body $3\frac{1}{2}$ lines ; of the wings 6 lines.

Natal.

Sub-Fam. ANTHOMYIDES.

Genus Aricia, Desv.

Aricia rescita.

Fœm.—Cinerea, capite albo, frontalibus nigris, antennis longiusculis, aristâ plumosâ, thorace vittis quatuor nigricantibus, abdomine tessellato, alis sub-cinereis, lituris duabus (unâ basali, alterâ costali) nigris, venis transversis nigro-nebulosis, alulis albis.

Female.—Cinereous : head white ; frontalia black ; antennæ reaching the epistoma ; arista plumose ; thorax with four blackish stripes ; abdomen tessellated ; wings greyish ; veins black ; a black mark in the disk near the base and another on the costa ; præbrachial transverse vein clouded with black ; discal transverse vein slightly clouded with black, forming a slight outward angle, parted by much less than its length from the border, and by not less than its length from the præbrachial transverse vein ; alulæ white.

Length of the body $2\frac{1}{2}$ lines ; of the wings 5 lines.

Mexico.

Aricia procedens.

Fœm.—Cinerea, capite albo, palpis antennisque nigris, thorace vittis quatuor indistinctis fuscescentibus, abdomine maculis quatuor magnis obscurè fuscis, pedibus fulvis, alis cinereis, venis transversis nigro-nebulosis, venâ discali transversâ intus arcuatâ, alulis albido-cinereis.

Female —Cinereous : head white ; vertex cinereous ; proboscis, palpi and antennæ black ; third joint of the antennæ long, reaching the epistoma ; thorax with four indistinct brownish stripes ; abdomen with four large dark brown spots ; legs tawny ; tibiæ and fore femora darker than the posterior femora ; wings grey ; veins black ; transverse veins clouded with black ; discal transverse vein curved inward, parted by much less than its length from the border, and by about its length from the præbrachial transverse vein ; alulæ whitish cinereous.

Length of the body 3 lines ; of the wings 6 lines.

Mexico.

Aricia circulatrix.

Fœm.—Cana, setis nonnullis longis validis, capite albido, frontalibus atris, palpis piceis, antennarum articulo 3° longo basi rufo, arista plumosa, thorace vittis quatuor angustis nigris, abdomine fasciis duabus latis cinereis, pedibus fulvis validis longiusculis, tarsis nigris, alis sub-cinereis, venâ discali transversâ intus sub-arcuatâ, alulis albis, halteribus fulvis.

Female.—Hoary, moderately broad, with some long stout bristles: head white; frontalia deep black, widening in front; epistoma not prominent; palpi slender, piceous; antennæ nearly reaching the epistoma; third joint slender, linear, red at the base, about four times the length of the second; arista plumose, much longer than the third joint; thorax with four slender black stripes; abdomen with two broad cinereous bands in the middle, not longer than the thorax; legs tawny, stout, rather long; tarsi black; wings greyish; veins black; discal transverse vein slightly curved inward in the middle, parted by very much less than its length from the border, and by more than its length from the præbrachial transverse vein; alulæ white; halteres tawny.

Length of the body 4½ lines; of the wings 10 lines.

Mexico.

Aricia inducta.

Cinerea, capite albido, antennis nigris, articulo 2° rufo, thorace vittis quatuor nigricantibus, abdomine sub-tessellato, pedibus testaceis, tarsis nigris, alis sub-cinereis.

Cinereous: head whitish in front about the eyes; antennæ black; second joint red; thorax with four blackish stripes; abdomen slightly tessellated; legs testaceous; tarsi black; wings greyish; veins black, testaceous towards the base; discal transverse vein angular inward, parted by less than its length from the border and by a little more than its length from the præbrachial transverse vein.

Length of the body 3½ lines; of the wings 6½ lines.

New South Wales.

Genus Ophyra, Desv.

Ophyra intendens.

Nigra, nitens, thorace vittato?, pectore cinereo, alis cinereis, venis transversis nigro-nebulosis, halteribus testaceis.

Black, shining: palpi and antennæ black; arista bare; thorax striped?; pectus with cinereous tomentum; wings grey; veins black; transverse veins clouded with black; discal transverse

vein hardly curved, parted by a little less than its length from the border, and by a little more than its length from the præbrachial transverse vein ; halteres testaceous.

Length of the body 3 lines ; of the wings 6 lines.

New South Wales.

Ophyra congressa.

Anthracina, sub-pilosa, abdomine pubescente, alis sub-cinereis, venis testaceis, alulis sub-cinereis testaceo-marginatis, halteribus albidis.

Coal black, slightly pilose : abdomen thickly pubescent ; wings slightly greyish ; veins testaceous ; discal transverse vein oblique, hardly curved, parted by about half its length from the border, and by hardly less than its length from the præbrachial transverse vein ; alulæ slightly cinereous, with testaceous borders ; halteres whitish.

Length of the body $2\frac{1}{2}$ lines ; of the wings 5 lines.

Hindostan.

Genus Anthomyia, Meigen.

Anthomyia protrita.

Fœm.—Cinerea, capite albido, frontalibus atris, antennis brevibus, thorace vittis quatuor angustis nigricantibus, abdomine tessellato, pedibus nigris, alis sub-cinereis, venâ præbrachiali angulum obtusum fingente, venâ discali transversâ subrectâ.

Female.—Cinereous : head whitish ; frontalia deep black ; antennæ short, not reaching the epistoma ; thorax with four slender blackish stripes ; abdomen tessellated ; legs black ; wings greyish ; veins black ; præbrachial vein forming an obtuse but well defined angle, slightly curved inward from thence to its tip, which is somewhat in front of the tip of the front ; discal transverse vein nearly straight, parted by about its length from the border, and by much less than its length from the flexure of the præbrachial ; alulæ white.

Length of the body $2\frac{1}{2}$ lines ; of the wings 4 lines.

Mexico.

Anthomyia prolectata.

Fœm.—Cyanescente nigra, capite albo, vertice palpis antennis pedibusque nigris, thoracis vittis duabus latis, lateribus pectoreque albis, abdomine subtessellato, alis sub-cinereis, venâ præbrachiali arcuatâ, venâ discali transversâ rectâ.

Female.—Bluish black : head white ; vertex, proboscis, palpi, antennæ and legs black ; thorax with two broad white stripes ;

sides and pectus also white; abdomen slightly tessellated; wings slightly greyish; veins black; præbrachial vein curved; ending at the tip of the wing; discal transverse vein straight, parted by half its length from the border and by more than its length from the flexure of the præbrachial; alulæ whitish.

Length of the body $3\frac{1}{2}$ lines; of the wings 7 lines.

Natal.

Genus Hylemyia, Desv.

Hylemyia probata.

Mas.—Atra, gracilis, aristâ subplumosâ, abdomine pedibusque nigris, alis nigricantibus apud costam nigris, venâ præbrachiali arcuatâ, venâ discali transversâ rectâ, alulis nigricantibus.

Male.—Deep black, slender: arista slightly plumose; abdomen and legs black; wings blackish, black along the costa; veins black; præbrachial vein curved, ending at just in front of the tip of the wing; discal transverse vein straight, parted by a little more than half its length from the border, and by very much more than its length from the flexure of the præbrachial; alulæ blackish.

Length of the body 2 lines; of the wings 4 lines.

Mexico.

Genus Cœnosia, Meigen.

Cœnosia intacta.

Cana, subsetosa, antennis pallide rufis longiusculis apice nigricantibus, abdominis segmentis nigro-bimaculatis albo-marginatis, pedibus testaceis, femoribus cinereis, alis albis, venis albidis, halteribus testaceis.

Hoary, slightly setose: antennæ pale red, blackish towards the tips, extending to the epistoma; third joint rather long; arista black; abdominal segments with a black spot on each side, their hind borders white; legs testaceous; femora cinereous, with testaceous tips; wings white; veins whitish; costal vein black; discal transverse vein straight, upright, parted by nearly twice its length from the border and by much more than its length from the præbrachial transverse vein; halteres testaceous.

Length of the body $1\frac{1}{2}$ lines; of the wings $2\frac{1}{2}$ lines.

United States.

Div. ACALYPTERÆ.

Sub-Fam. Helomyzides.

Genus Helomyza, Fall.

Helomyza gratiosa.

Testacea, capite maculis duabus superis guttisque duabus inferis nigris, antennarum articulo 3° supra nigro, aristâ plumosâ, thorace vittis quatuor maculisque lateralibus fulvis, pectore abdomineque piceis, hujus lateribus luteo-trimaculatis, pedibus nigris, tarsis luteis apice nigris, alis nigricantibus albido-maculatis, halteribus testaceis.

Testaceous: head with two black spots on the vertex, and with two black dots beneath, where it is paler; third joint of the antennæ black above; arista plumose; thorax with four tawny stripes and with a few tawny lateral spots; pectus and abdomen piceous, the latter with large luteous spots on each side; legs black; tarsi luteous, black towards the tips; wings blackish, with several whitish round spots, the two largest occupying the tip; halteres testaceous.

Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Natal.

Helomyza bipunctata.

Fulva, capite supra maculis duabus oblongis nigris, antennarum articulo 3° nigro, abdominis segmentis nigricante marginatis, tibiis apice tarsisque nigris, femoribus posticis guttâ apicali nigrâ, alis sub-testacco vitreis, venis pallide testaceis.

Tawny: head above with two black oblong spots, which spots are attenuated hindward; third joint of the antennæ black; hind borders of the abdominal segments blackish; tarsi and tips of the tibiæ black; hind femora with a black apical dot; wings with a slight testaceous tinge; veins pale testaceous; discal transverse vein straight, parted by more than half its length from the border and by much more than its length from the præbrachial transverse vein.

Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Tasmania.

Genus Dryomyza, Meig.

Dryomyza maculiceps.

Testacea, capite guttis quatuor nigris, antennis breviusculis, aristâ nudâ, thorace vittis quinque ferrugineis, pectore guttis quatuor lateralibus nigris, abdomine fuscescente, basi tes-

taceo, tarsis apice fuscescentibus, alis sub-cinereis, venâ discali transversâ rectâ, strigâ discali nigrâ.

Testaceous: head with two black dots above the insertion of the antennæ and two more by the epistoma; antennæ short; third joint elongate-conical; arista bare; thorax with five ferruginous stripes; pectus with two black dots on each side; abdomen brownish, except at the base; tarsi brownish towards the tips; wings greyish; veins black, testaceous at the base; discal transverse vein straight, upright, parted by full its length from the border, and by more than twice its length from the præbrachial transverse vein; a black streak in the disk.

Length of the body 3 lines; of the wings 8 lines.

Mexico.

Genus Cœlepa, Meigen.

Cœlepa offendens.

Cinerea, capite longiusculo apud oculos albo, antennis nigris, thorace vittis canis, abdominis apice pedibusque fuscescentibus, alis sub-cinereis, venis pallide-testaceis, halteribus albidis.

Cinereous: head somewhat elongate, white about the eyes; antennæ black; thorax with hoary stripes; abdomen brownish at the tip; legs brownish; wings very slightly greyish; veins pale testaceous; discal transverse vein straight, upright, parted by much less than its length from the border, and by much more than twice its length from the præbrachial transverse vein; halteres whitish.

Length of the body $2\frac{1}{2}$ lines; of the wings 5 lines.

Tasmania.

Genus Sciomyza, Fallen.

Sciomyza transducta.

Cinerea, capite antico testaceo, antennis abdomineque nigris, pedibus fulvis, tarsis anticis nigris, alis sub-cinereis, costâ exteriore liturisque discalibus obscurioribus, halteribus testaceis.

Cinereous: head testaceous in front and beneath; antennæ black; abdomen black; legs tawny; fore-tarsi black; wings slightly greyish, dark grey along the apical part of the costa, and mottled with dark grey in the disk; discal transverse vein slightly curved and oblique, parted by half its length from the border, and by nearly twice its length from the præbrachial transverse vein; halteres testaceous.

Length of the body $1\frac{1}{2}$ line; of the wings 3 lines.

United States.

Genus Sapromyza, Meig.

Sapromyza apta.

Testacea, subsetosa, capite albido, tarsis nigris, alis cinereo-vitreis, vittâ costali informi nigrâ, venis discali et præbrachiali transversis nigro-nebulosis.

Testaceous, slightly setose: head whitish, testaceous about the eyes; tarsi black; wings greyish-vitreous, with a black irregular costal stripe extending from a little before two-thirds of the length of the costa to the præbrachial vein; discal and præbrachial transverse veins clouded with black; discal transverse vein parted by less than half its length from the border, and by a little less than its length from the præbrachial transverse vein.

Length of the body 2 lines; of the wings 4 lines.

Mexico.

Genus Tetanocera, Dumeril.

Tetanocera pectoralis.

Testacea, capite guttis tribus anticis, thorace vittis duabus, pectore guttis duabus lateralibus tarsisque anticis nigris, antennis longiusculis, articulo 3° lanceolato, aristâ plumosâ, pectore strigis duabus lateralibus fuscis, alis sub-cinereis apud costam nigris, venâ discali transversâ rectâ.

Testaceous: head in front with three black dots; antennæ rather long; third joint lanceolate; arista plumose; thorax with two black stripes; pectus with a black dot on each side by the base of the wing and a contiguous brown streak; fore tarsi black; wings greyish, black along the costa; discal transverse vein straight, upright, parted by about its length from the border, and by much more than its length from the præbrachial transverse vein.

Length of the body 2 lines; of the wings 4 lines.

Mexico.

Tetanocera discalis.

Testacea, capite supra fulvo, antennis nigricantibus, thorace vittis duabus angustis interruptis nigris, pectore vittis duabus latis nigris, abdomine nigro, vittâ discali testaceâ, alis nigricantibus albo-guttatis.

Testaceous: head tawny above; antennæ blackish; thorax with two slender interrupted black stripes; pectus with two broad black stripes; abdomen black, with a testaceous dorsal stripe which does not extend to the tip; wings blackish, with white dots on the costa, two on the hind border and a larger apical one.

Length of the body 3½ lines; of the wings 7 lines.

Burmah.

Sub-Fam. LAUXANIDES.

Genus Lonchœa, Fall.

Lonchœa discrepans.

Æneo-nigra, antennis testaceis, articulo 3° brevi conico, aristâ plumosâ, pedibus piceis, tarsis testaceis, alis sub-cinereis, halteribus albis.

Æneous black: antennæ testaceous; third joint short, conical; arista plumose; legs piceous; tarsi testaceous; wings greyish; veins black; halteres white.

Length of the body $1\frac{1}{2}$ line; of the wings 4 lines.

Mexico.

Sub-Fam. ORTALIDES.

Genus Dacus, Fabr.

Dacus pectoralis.

Ferrugineus, antennarum articulo 3° lineari gracillimo longissimo, scutello pectoris fasciis duabus, maculisque duabus et segmenti abdominalis 1i margine postico pallide flavis, femoribus basi flavis, tarsis albidis apice ferrugineis, alis sub-cinereis, vittâ costali strigâque apud venam sub-analem fuscis.

Ferruginous: third joint of the antennæ linear, slender, very long, reaching the epistoma; scutellum pale yellow; pectus with a pale yellow, slightly oblique band, and with a posterior pale yellow spot on each side; abdomen with a slender yellow band on the hind border of the first segment; femora yellow towards the base; tarsi whitish, with ferruginous tips; wings very slightly greyish, with a brownish costal stripe, which is wider exteriorly, and with a brown streak along the subanal vein; discal transverse vein straight, oblique, parted by about one-fourth of its length from the border, and by about its length from the præbrachial transverse, which is oblique in the opposite direction.

Length of the body 4 lines; of the wings 8 lines.

Natal.

Dacus brevistriga.

Fœm.—Ferrugineus, capite testaceo, antennis fulvis, thorace vittâ tomentosâ albidâ, scutello pectorisque maculis duabus lateralibus flavis, pedibus testaceis, alis vitreis vittâ costali fuscâ, venâ præbrachiali transversâ fusco-nebulosâ.

Female.—Ferruginous: head testaceous; antennæ tawny; third joint rather shorter than that of *D. pectoralis*; thorax with a

whitish tomentose stripe; scutellum yellow; pectus with a large pale yellow spot on each side; legs testaceous; wings vitreous, with a brown costal stripe which extends round the tip to the end of the præbrachial vein; præbrachial transverse vein clouded with brown; radial vein very near the costa; præbrachial vein slightly curved between its tip and the discal transverse vein; the latter straight, upright, parted by less than one-fourth of its length from the border, and by a little less than its length from the præbrachial transverse, which is slightly oblique.

Length of the body 3½ lines; of the wings 6 lines.

Natal.

Dacus incisus.

Niger, capite fulvo, thoracis vittis duabus lateralibus posticis, callis humeralibus, scutello, pectoris fasciis duabus maculisque duabus lateralibus, necnon abdominis basi et segmenti 1^i^ margine postico flavis, ventre testaceo vittâ nigrâ, femoribus posticis tarsisque anterioribus basi, tarsisque posticis flavis, tibiis anticis fulvis, alis vitreis, vittâ costali nigrâ.

Black: head tawny; thorax with a yellow stripe on each side hindward; humeral calli and scutellum yellow; pectus with a yellow, slightly oblique band, and with a posterior yellow spot on each side; abdomen yellow at the base, and with a yellow band on the hind border of the first segment; this band is excavated in the middle of the fore border; underside testaceous, with a black stripe which widens much hindward; anterior tarsi yellow towards the base; fore tibiæ tawny; hind tarsi yellow; hind femora yellow for half the length from the base; wings vitreous, with a slender black costal stripe which extends to the tip; structure of the veins like that of *D. brevistriga*.

Length of the body 2½ lines; of the wings 5 lines.

Burmah.

Dacus squalidus.

Obscurè testaceus, sub-pubescens, vertice nigricante, antennis fulvis longiusculis, thoracis disco fulvo, alis maculis duabus costalibus sub-cinereis.

Mas.—Abdomine nigricante compresso.

Fœm.—Abdominis dimidio apicali ferrugineo depresso nitente.

Dull testaceous, somewhat pubescent: vertex of the head blackish; face oblique, with two grooves for the reception of the antennæ; the latter tawny, extending to the epistoma; second joint rather long; third slightly narrower towards the tip; disk of the thorax tawny; wings with a greyish costal spot before the

middle, and another more diffuse one on the apical part; discal transverse vein slightly bent inward, parted by about one-third of its length from the border and by less than its length from the præbrachial transverse vein.

Male.—Abdomen blackish, compressed.

Female.—Apical half of the abdomen ferruginous, depressed, shining.

Length of the body 3—3½ lines; of the wings 5½—6 lines.

Hindostan.

Genus Bricinnia, N.

Corpus longiusculum, sat angustum. Peristoma magnum. Antennarum articulus 3us longus, gracilis, linearis; arista simplex, gracilis. Thorax longus, lateribus compressis. Abdomen longum, subfusiforme, apice attenuatum. Pedes validi. Alæ sat angustæ, venis rectis.

Fœm.—Oviductus vaginæ productæ, graciles.

Body rather long and narrow. Epistoma rather prominent; mouth large; third joint of the antennæ long, slender, linear, extending to the epistoma; arista slender, simple, nearly twice the length of the third joint. Thorax long, compressed on each side. Abdomen long, subfusiform, attenuated towards the tip. Legs stout, moderately long. Wings rather narrow; veins straight.

Female.—Abdomen attenuated at the tip. Vagina of the oviduct slender, produced.

Bricinnia flexivitta.

Fœm.—Nigra, capite apud oculos albo, vittâ anticâ albidâ, antennis ferrugineis basi fulvis, thorace vittis tribus albidis, pectore purpureo-cyaneo, abdomine cupreo, femoribus posticis basi flavis, tarsis fulvis, alis sub-cinereis, costâ apiceque luridis, vittâ discali angulatâ nigrâ, venâ discali transversâ vix arcuatâ.

Female.—Black: head white about the eyes and with a whitish facial stripe, which is dilated towards the epistoma; antennæ ferruginous, tawny towards the base; thorax with three whitish stripes; pectus blue, varied with purple; abdomen cupreous; vaginæ of the oviduct attenuated; hind femora yellow towards the base; tarsi tawny; wings greyish, lurid along the costa and at the tips, and with a blackish stripe which extends from the base to and along the discal transverse vein; the latter is upright and hardly curved, and is parted by four times its length from the

border, and by a little less than its length from the præbrachial transverse vein, which is oblique.

Length of the body 5 lines; of the wings 10 lines.

Mexico.

Genus Charax.

Corpus longum, gracile. Antennarum articulus 3us longus, lanceolatus; arista simplex, gracilis. Thorax longissimus, lateribus compressis. Abdomen valde compressum, thorace brevius et angustius. Alæ angustæ, venis subrectis.

Fœm.—Abdomen apice attenuatum et acuminatum.

Body long, slender. Epistoma prominent. Antennæ with the third joint long, lanceolate, nearly reaching the epistoma; arista long, slender, nearly twice the length of the third joint. Thorax very long; sides compressed. Abdomen much compressed, narrower and shorter than the thorax. Legs moderately long and stout. Wings narrow; veins almost straight.

Female.—Abdomen attenuated and acuminated at the tip.

Charax planidorsum.

Viridescente nigra, thorace vittis tribus sub-cinereis, abdomine viridi-metallico, antennis pedibusque nigris, alis sub-cinereis vittâ tenui costali nigrâ, venâ discali transversâ rectâ, venâ præbrachiali transversâ brevissimâ.

Greenish black: thorax with three greyish stripes; abdomen metallic green; antennæ and legs black; wings greyish, with a slender black stripe along the costa from one-third of the length to the end of the præbrachial vein, the latter is slightly curved upward towards the tip; discal transverse vein straight, upright, parted by less than one-third of its length from the border, and by nearly twice its length from the præbrachial transverse; the latter is extremely short, the veins which it connects being almost contiguous between it and the base of the wing.

Length of the body 4 lines; of the wings 12 lines.

Burmah.

Genus Ortalis, Fallen.

Ortalis leucomelas.

Nigro-viridis, antennis pedibusque nigris, tarsis piceis, alis albis nigro-quadrifasciatis, fasciâ 1â basali, 2â 3âque posticè dilatatis, 4â costali; halteribus albis.

Blackish-green: antennæ and legs black; tarsi piceous; wings white, with four black bands; first band near the base; second

broad, much dilated hindward; third narrow, also dilated hindward; fourth costal, joining the third at much beyond half the length of the costa, and extending thence to a little beyond the tip of the wing; discal transverse vein parted by one-fourth of its length from the border, and by more than twice its length from the præbrachial transverse vein; halteres white.

Length of the body 2½ lines; of the wings 4 lines.

South America.

Ortalis bipars.

Nigricante viridis, capite supra antennisque rufis, harum articulo 3° longo lineari, pedibus nigris, alis albis nigro-trifasciatis et apice maculatis, vittis 2â 3âque posticè obsoletis, 1â incompletâ, halteribus pallidis.

Blackish-green: head above and antennæ red; third joint of the antennæ long, linear; legs black; wings white, with three slight black bands and a black apical spot; first band very incomplete; second and third obsolete hindward; discal transverse vein straight, upright, parted by one-fourth of its length from the border and by much more than its length from the præbrachial transverse vein; halteres pale.

Length of the body 2½ lines; of the wings 4 lines.

United States.

Ortalis alternata.

Viridi-nigra, nitens, capite rufo apud oculos subtusque testaceo, antennis rufis breviusculis, pedibus nigris, tarsis testaceis apice nigris, alis albis, fasciis tribus strigis duabus costalibus maculâque apicali nigris, halteribus albis.

Greenish-black, shining: head red, testaceous about the eyes and beneath; antennæ red, rather short; legs black; tarsi testaceous, with black tips; wings white, with three black bands, which are paler hindward; first and second bands slightly curved; first extending along the costa to the base of the wing; a short costal streak between the second and third bands; another beyond the third band, having behind it a black dot; a black apical spot; halteres white.

Length of the body 2 lines; of the wings 3½ lines.

Cape.

Genus Trypeta, Meig.

Trypeta polygramma.

Fuscescens, capite cinereo guttis duabus nigris, antennis testaceis brevissimis, thoracis vittâ anticâ, scutelli margine pectoreque cinereis, abdomine nigro maculis duabus basalibus

albidis, pedibus nigris, genubus tibiarum fasciâ tarsisque posterioribus albidis, alis nigricantibus, guttis plurimis, maculis quatuor apicalibus lineâque intermediâ flexuosâ albis.

Brownish: head cinereous, rather prominent and with a black dot on each side above the antennæ, which are testaceous and very short; thorax with a cinereous stripe in front, mostly cinereous on each side; scutellum bordered with cinereous; pectus cinereous; abdomen black, with a whitish spot on each side at the base; legs black; knees whitish; tibiæ with a whitish band; posterior tarsi whitish, with dark tips; wings blackish, with four connected white apical spots; these are divided by some space from numerous white discal dots, which are bounded exteriorly by a white serpentine line.

Length of the body 2 lines; of the wings 4 lines.

Natal.

Sub-Fam. SEPSIDES.

Genus Calobata, Fabr.

Calobata cyanescens.

Cyanescente nigra, capite cyaneo apud oculos albo, vertice atro, pedibus piceis, femoribus posticis testaceo-unifasciatis, femoribus tibiisque anticis nigris, tarsis anticis albis apice nigris, alis obscurè cinereis.

Bluish-black. Head blue, with shining white tomentum about the eyes; vertex deep black. Legs piceous, long, slender; hind femora with a testaceous band near the tips; fore-legs black, their tarsi white, with black tips. Wings dark grey; veins black; radial and præbrachial veins converging towards the tip of the wing, where they are nearly contiguous; discal transverse vein straight, nearly upright, parted by four times its length from the discal transverse vein, and by less than its length from the border.

Length of the body 6 lines; of the wings 10 lines.

Burmah.

Calobata bicolor.

Rufa, pectore et abdomine cyaneo-nigris, pedibus nigris, tarsis anticis albis, femoribus posterioribus piceis albo-fasciatis, tarsis posterioribus testaceis, alis sub-cinereis fusco-quadrifasciatis.

Red: pectus and abdomen bluish black; legs black; fore tarsi white; posterior femora piceous, with a white band near the tips; posterior tarsi testaceous; wings slightly greyish, with four brown bands, the middle one about four times the breadth of the first;

the third apical, paler than the others and much broader than the first; veins black, like those of the preceding species in structure.

Length of the body 3½ lines; of the wings 6 lines.

Genus Michogaster, Macq.

Michogaster basistriga.

Testacea, capite transverso antice depresso, antennarum articulo 3° lineari, pectore abdomineque nigris, tibiis posticis nigris subarcuatis, tarsis posticis basi albidis, alis vitreis macula apicali nigra, venis transversis basalibus et præbrachiali nigro-nebulosis, halteribus albis.

Testaceous: head transverse, a little broader than the thorax, flat and slightly oblique in front; face retracted; antennæ not extending to the epistoma; third joint linear, rounded at the tip; arista very slender, more than twice the length of the third joint; pectus and abdomen black; hind tibiæ black, slightly curved; hind tarsi whitish towards the base; wings vitreous, with a black apical spot; basal transverse veins and præbrachial transverse vein clouded with black; discal transverse vein almost straight and upright, parted by less than half its length from the border and by more than twice its length from the præbrachial transverse vein; halteres white.

Length of the body 3 lines; of the wings 4½ lines.

South America.

Michogaster marginalis.

Testacea, antennis nigris longis, thorace fusiformi, abdomine subclavato, pedibus longiusculis, tarsis nigris, alis vitreis apud costam nigris, halteribus apice nigris.

Testaceous, slightly setose: head a little broader than the thorax, oblique and depressed in front; face retracted, and thus forming an angle with the front; antennæ black, extending to the epistoma; third joint linear, slender, very long; arista very minutely pubescent, longer than the third joint; thorax fusiform; abdomen sub-clavate, much longer than the thorax; legs rather long; tarsi black; wings vitreous, black along the costa to a little beyond the tip; præbrachial transverse vein clouded with black; discal transverse vein slightly oblique and curved, parted by one-fourth of its length from the border and by twice its length from the præbrachial transverse vein; halteres with black knobs.

Length of the body 4 lines; of the wings 5½ lines.

Amazon Region.

Genus Nemopoda, Desv.

Nemopoda induans.

Nigra, obscura, capite supra nitente, antennis piceis, pedibus testaceis, posticis nigris, femoribus posticis basi tarsisque posticis testaceis, coxis albidis, alis sub-cinereis, halteribus testaceis.

Black, dull: head shining above; antennæ piceous; legs testaceous; hind legs black; hind femora at the base, hind tarsi, excepting the tips and hind knees, testaceous; coxæ whitish; wings vitreous, slightly cinereous; discal transverse vein parted by more than its length from the border and from the præbrachial transverse vein; halteres testaceous.

Length of the body 2½ lines; of the wings 4 lines.

South America.

Sub-Fam. DIOPSIDES.

Genus Diopsis, Linn.

Diopsis obstans.

Mas.—Nigra, gracilis, oculorum petiolis thorace non longioribus apice ferrugineis, abdomine fasciis cinereis, pedibus piceis, coxis, femoribus posterioribus basi tarsisque anticis albidis, his apice nigris, alis sub-cinereis fuscescente sub-nebulosis apice fuscescentibus.

Male.—Black, slender: petioles of the eyes about as long as the thorax, their knobs with the apical half ferruginous; scutellum with two long slender spines; abdomen with cinereous bands; legs piceous; coxæ whitish; posterior femora whitish at the base; fore tarsi whitish, with black tips; wings greyish, slightly brownish in the disk, and with brownish tips.

Length of the body 2½ lines; of the wings 4 lines.

Natal.

Sub-Fam. PSILIDES.

Genus Loxocera, Fabr.

Loxocera? quadrilinea.

Fulva, nitens, capite antico depresso, antennarum articulo 3° nigro longissimo, thoracis vittis quatuor, abdomine, tibiis anticis apice tarsisque anticis nigris, alis vitreis, halteribus albidis.

Tawny, shining: head flat in front; antennæ slender, linear, longer than the breadth of the head; third joint black; thorax with two slight black stripes on each side; abdomen, fore tarsi and tips of fore tibiæ black; wings vitreous; veins black, straight;

discal transverse vein very far from the border, and parted by more than twice its length from the præbrachial transvere vein; halteres whitish.

Length of the body 1¼ line; of the wings 2½ lines.

United States.

Genus Chyliza, Fallen.

Chyliza nigro-viridis.

Fœm.—Nigro-viridis, capite apud oculos albo, antennis nigris, thoracis tomento cinereo, abdomine lanceolato, pedibus pallide fulvis, alis vitreis, venis testaceis, halteribus albidis.

Female.—Blackish-green: head whitish about the eyes; antennæ black; thorax with cinereous tomentum; abdomen lanceolate, very much longer than the thorax; legs pale tawny; wings vitreous; veins testaceous; halteres whitish.

Length of the body 2½ lines; of the wings 4 lines.

United States.

Sub-Fam. GEOMYZIDES.

Genus Opomyza, Fallen.

Opomyza signicosta.

Testacea, capite antico albido, thorace robusto, abdominis maculis tribus dimidioque apicali nigris, pedibus albidis, alis sub-cinereis, maculis duabus costalibus nigricantibus.

Testaceous: head whitish in front; thorax rather stout; abdomen with a spot on each side near the base, a dorsal spot, and the apical half black; legs whitish; wings slightly greyish, with a blackish spot on the costa near the base, and another at two-thirds of the length; discal transverse vein straight, parted by twice its length from the border, and by much more than twice its length from the præbrachial transverse, which is near the base.

Length of the body 1½ line; of the wings 3 lines.

United States.

Genus Drosophila, Fallen.

Drosophila dorsivitta.

Testacea, valida, nitens, vittâ abdominali nigrâ, pedibus albidis, alis vitreis, venis testaceis apud costam nigris.

Testaceous, stout, shining: abdomen with a black dorsal stripe; legs whitish; wings vitreous; veins testaceous, black along the costa; discal transverse vein straight, parted by less than its length from the border, and by more than twice its length from the præbrachial transverse vein.

Length of the body 1¼ line; of the wings 2½ lines.

South America.

Drosophila inversa.

Fusca, subtus pallidior, antennis abdomineque nigris, thoracis tomento cinereo, pedibus testaceis, alis sub-cinereis, vittâ costali exteriore obscuriore, venis nigris, halteribus albidis.

Brown, paler beneath: antennæ black; thorax with cinereous tomentum; abdomen black; legs testaceous; wings very slightly greyish, with a darker grey stripe along the apical half of the costa; veins black; discal transverse vein straight, parted by twice its length from the border, and by more than twice its length from the præbrachial transverse vein; halteres whitish.

Length of the body 1¼ line; of the wings 3 lines.

United States.

Genus Asteia, Meig.

Asteia? tenuis.

Nigra, nitens, gracillima, antennis albidis, thoracis disco pallide cinereo, pedibus albido-testaceis, alis cinereis perangustis, costâ albâ apice nigricante, margine postico vitreo, halteribus pallidis.

Black, shining, very slender: antennæ whitish; disk of the thorax pale cinereous; legs whitish testaceous; wings grey, very narrow, vitreous along the hind border, white along the costa, whose tip is blackish; discal transverse vein straight, oblique, parted by less than its length from the border, and by much more than its length from the præbrachial transverse vein; halteres pale.

Length of the body 2 lines; of the wings 3 lines.

United States.

NEMOCERA.

Fam. BIBIONIDÆ.

Genus Bibio, Geoffr.

Bibio criorhinus?

Fœm.—Cyaneo-niger, capite nigro valde attenuato, abdomine atro, alis halteribusque nigris.

Mas.—Pilosissimus, tibiis ferrugineis apice nigris, tarsorum articulis basi ferrugineis, alis sub-cinereis, venis albidis apud costam nigris.

Bibio criorhinus? Bellardi, Ditt. Mess. i. 17, 1.

Female. — Bluish-black: head black, much prolonged and

attenuated in front; abdomen deep black; wings and halteres black.

Male.—Body very pilose; tibiæ ferruginous, with black tips; joints of the tarsi ferruginous at the base; wings very slightly greyish; veins whitish; costal veins black.

Length of the body $2\frac{1}{2}$—3 lines; of the wings 5—6 lines.

Mexico.

Bibio birudis.

Mas.—Ater, thorace cyaneo-nigro, tibiis posticis femoribusque canaliculatis, femoribus tibiisque posticis clavatis, alis nigricante cinereis apud costam nigricantibus.

Male.—Deep black: thorax bluish black; femora and hind tibiæ channelled; hind femora and hind tibiæ clavate; wings blackish cinereous, blackish along the costa.

Length of the body 3 lines; of the wings 6 lines.

Natal.

Genus Dilophus, Meig.

Dilophus desistens.

Fœm.—Niger, abdomine sub-tuberculato, pedibus testaceis, femoribus tibiis tarsisque apice nigris, coxis femoribusque anticis dilatatis, his sub-spinosis, alis albidis, venis albis, stigmate pallidè fusco, halteribus testaceis.

Female.—Black: abdomen tuberculated; legs testaceous; femora, tibiæ and tarsi with black tips; fore coxæ and fore femora dilated, the latter minutely spinose; wings whitish; veins white; stigma pale brown; halteres testaceous.

Length of the body $1\frac{3}{4}$ line; of the wings 3 lines.

New South Wales.

Fam. SIMULIDÆ.

Genus Simulium, Latr.

Simulium ochraceum.

Fœm.—Testaceum, albo-tomentosum, capite albo, thorace ochraceo vittis duabus albis, abdomine nigricante basi testaceo, femoribus tibiisque apice nigris, tarsis nigris basi testaceis, alis vitreis pallido-venosis.

Female.—Testaceous, with white tomentum: head white; antennæ testaceous; thorax ochraceous, with two white stripes; abdomen blackish, testaceous at the base; femora and tibiæ with

black tips; tarsi black, testaceous towards the base; wings vitreous; veins pale testaceous.

Length of the body 1 line; of the wings 2½ lines.

Mexico.

This species can hardly be the female of *S. metallicum*, Bellardi.

Fam. TIPULIDÆ.

Genus Limnobia, Meig.

Limnobia stupens.

Fœm.—Fusca, palpis nigris, antennis pubescentibus brevissculis basi testaceis, pectore testaceo lateribus nigricantibus, abdomine lurido vittâ dorsali nigricante, pedibus testaceis longiusculis, femoribus apice nigricantibus, alis cinereis, costâ venisque fusco-marginatis, halteribus testaceis apice fuscis.

Allied to Div. H. Meigen.

Female.—Brown: palpi black; antennæ pubescent, testaceous at the base, about twice longer than the breadth of the head; pectus testaceous, blackish on each side; abdomen lurid, with a blackish dorsal stripe; legs testaceous, rather long and slender; femora with blackish tips; wings grey, brownish along the costa and along the veins; halteres testaceous, with brown knobs.

Length of the body 6 lines; of the wings 10 lines.

Mexico.

Limnobia nigricola.

Fœm.—Atra, antennis validis setaceis non longis, pedibus non elongatis, alis nigris.

Female.—Deep black: antennæ stout, setaceous, moniliform, about twice longer than the breadth of the head; legs moderately long; wings black.

Length of the body 3½ lines; of the wings 7 lines.

United States.

Genus Tipula, Linn.

Tipula associans.

Mas.—Testacea, antennis apice fuscescentibus non pilosis, thorace vittis tribus fuscis, lateralibus duplicatis, abdomine apicem versus nigricante, pedibus gracillimis, tarsis longissimis, alis sub-cinereis, maculis costalibus unâque discali oblongis fuscis.

Male.—Testaceous: antennæ setaceous, not pilose, brownish towards the tips, much longer than the breadth of the head: thorax with three brown stripes, the lateral pair double; abdomen blackish towards the tip, which is pale testaceous; legs very

slender; tarsi extremely long, thread-like; wings greyish, with oblong brown spots along the costa, and with an oblong brown spot in the discal areolet; veins black, strongly marked; halteres with brownish knobs.

Length of the body 7 lines; of the wings 18 lines.

Mexico.

Tipula dispellens.

Fœm.—Pallidè cinerea, capite maculis duabus fuscescentibus, palpis basi nigricantibus, antennis setaceis breviusculis non pilosis, thorace cervino vittis fuscis, abdomine supra fuscescente, pedibus gracillimis pallide testaceis, femoribus fuscescentibus, tarsis longissimis, alis sub-cinereis, costâ venisque fusco-lineatis, halteribus albidis apice fuscis.

Female.—Pale cinereous: head with two brownish spots on the vertex; fore part dark brown beneath; palpi blackish towards the base; antennæ setaceous, moniliform not pilose, a little longer than the breadth of the head; thorax fawn colour, with two parallel brown stripes, on each side of which are two brown streaks; hind part pale cinereous, with three brown stripes; abdomen brownish above; legs pale testaceous, very slender; femora brownish, tarsi very long; wings slightly greyish, brownish along the costa and along the veins, which are dark brown; halteres whitish, with brown knobs.

Length of the body 7 lines; of the wings 16 lines.

Mexico.

Genus Pachyrhina, Macq.

Pachyrhina nigrolutea.

Mas.—Lætè flava, capite maculâ trigonâ nigrâ vittâque anticâ nigricante, antennis nigris basi flavis, thorace vittis tribus latis nigris, pectore maculis variis nigris, abdomine nigro basi subtusque testaceo, pedibus nigricantibus, femoribus flavis, alis sub-cinereis apud costam sub-luridis, stigmate fusco.

Tipula nigrolutea? Bellardi, Ditt. Mess. 1, 11, 7.

Male.—Bright yellow: head with a large black triangular spot on the vertex; mouth with a blackish stripe; antennæ black, yellow at the base; thorax with three broad black stripes; pectus with various black marks; abdomen black, testaceous at the base and beneath; legs blackish, very slender; coxæ and femora pale yellow, the latter with black tips; wings slightly greyish, with a slight lurid tinge along the costa; veins testaceous, black towards the tips; stigma brown; halteres with whitish tips.

Length of the body 5 lines; of the wings 10 lines.

Mexico.

XXIV. *Contributions to an Insect Fauna of the Amazon Valley.* (*Continued from page* 228.) By H. W. Bates, Esq., Cor. Memb. Ent. Soc.

[Read November 24th, 1860.]

Group 2. *P. Choridamas*, and allies.

The preceding group is connected, through *P. Madyes* and *Victorinus*, Dbld., with the series of fine species of which *P. Scamander*, Bdv., may be considered the type, but which has no representative in the equatorial low lands of America. Next to this might naturally be ranged the group to which *P. Polycaon* and *Thoas* belong; but I prefer to follow the very evident line of affinity which connects *Protodamas* of the preceding, to *Choridamas* of the present, group. Of the five species, viz.: *P. Choridamas*, Bdv.; *P. Hyperion*, Hübn.; *P. Phaon*, Bdv.; *P. Ulopos*, Gray, and *P. Pausanias*, Hewits., which belong hereto, the last mentioned is the only one found on the banks of the Amazon. The group is remarkable for the tendency to elongation in the wings, which reaches an extreme point in *P. Pausanias*; where the facies of a *Papilio* gives place to that of a *Heliconia*. It differs greatly in the antennæ from the species of the preceding group; those organs being short, with a strong abrupt club bent outwards, as in the species of the typical *Podalirius* group. The abdominal fold of the hind wings is very slight and turned downwards.

P. Pausanias, Hewits. Trans. Ent. Soc. 1852, pl. 6, f. 2.

On the Amazon I have seen this species only at Villa Nova and at Ega. The species of *Heliconia* which it most closely mimics is the *H. Clytia*; it has also something of the sailing, circling flight of the *Heliconia*, but in other respects shows very different habits. It is never seen in the shades of the woods, to which the *Heliconiæ* are confined; but is observed either about the summits of high trees, or settled on the muddy margins of the rivers and lakes in company with species of the preceding group.

Group 3. *P. Ilus*, and allies.

P. Eurytion, Hewits., of New Granada, connects the preceding naturally with the present group. Here commences the style of colouration, viz.: black ground colour, with crimson and white or green belts and spots, which characterizes the main body of Neo-Tropical *Papilios*. The species of the present group, however, differ from those of the chief group of these insects in their antennæ and habits. The antennæ are here generally short, and rather abruptly clavate, whilst always long and slender in the group mentioned. Their flight is much more powerful, and, instead of being confined to the shades of the forest, they frequent the sunny skirts of the woods, and are frequently found with other strong-flying *Papiliones* at the moist margins of the rivers. The abdominal fold to the hind wing of the males, also, is very different from that of the group alluded to, being scarcely perceptible, whilst always very largely developed in the insects composing the other group. The chief species are, *Ilus*, F.; *Ariarathes*, Esper; *Branchus*, Doubleday; *Harmodius*, Dbld.; *Eurytion*, Hewits., and *Hippason*, Cram.* The two last-mentioned differ greatly from the others in the antennæ, whilst agreeing with them well in all other respects.

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* Mr. Hewitson has lately acquired from Mexico an inexpressibly beautiful new species of this group, which I hope he will shortly figure and describe.

P. Ariarathes ..... ♀, Esper, Ausl. Schmett. t. 14, f. 2 (*Ariarathes*).
Gray, Cat. Lep. B. M. p. 60, pl. 11, f. 3 (as *Cyamon* ♀).
♂, Boisd. Sp. Gen. No. 104 (as *Ilus*, F.).
Gray, Cat. Lep. B. M. p. 61 (*Ariarathes* ♂).
♂ and ♀, Erichson in Schomb. Reise in Brit. Guiana, p. 593 (*Ariarathes* ♂ and ♀).

Local var. *Cyamon* ..... ♂, Gray, Cat. B. M. p. 60, pl. 7, f. 1 (*Cyamon* ♂).

Local var. *Gayi* ..... ♂ Lucas, Rev. et Mag. Zool. 1852, p. 195 (*Gayi*),

Local var. *Evagoras* .. ♂ and ♀, Gray, Cat. B. M. p. 61, pl. 9, f. 3 and 4 (*Evagoras* ♂ and ♀).

The figure of Esper does not show the pointed lobe in the middle of the margin of the hind wing, which, indeed, is indistinct in some individuals; otherwise it represents accurately the insect figured by Gray as *Cyamon* ♀. The ♂ was referred by Boisduval to the *Ilus* of Fabr., but it is easy to see from the description of Fabr., where he gives the fore wing beneath as immaculate, and the hind wing as having four red spots at the base, that he had in view a quite different species. The figure in Jones's drawings (of which Mr. Westwood kindly showed me a tracing) agrees with the Fabrician description, which, indeed, represents an insect that I have not yet seen in any collection. The number of the red spots at the base of the wings beneath in this group is an important specific character. *P. Ariarathes*, with all its varieties and unfixed local sub-species, has always two red spots at the base of each wing, with sometimes an indication of a third in the hind wing of the female. The species is one of the most unstable in its colouration, and partly so in its wing-outline; the varieties are generally, however, local, but the individuals composing them are not constant enough, nor are the characters sufficiently well defined, to induce me to treat them as independent sub-species. The individuals of the type vary amongst themselves in the same locality. The ♂, as pointed out by Erichson, has a triangular, dusty cream-coloured spot, variable in size, on the fore wing, proceeding from about the middle of the hind margin and extending obliquely outwards towards the middle of the wing. The apex of the spot sometimes terminates at the first, sometimes extends to the third median nervule. The red macular belt of the hind wing varies very much in breadth and in the number of spots of which it is composed. The typical form of *Ariarathes* I obtained chiefly at Pará, where none of the local varieties above cited occur. It is also found in English, Dutch and French Guiana. It is a rare species, and flies with great rapidity in sunny places about the borders of plantations.

Var. *Cyamon*, Gray, ♂. This is an extreme variety of the ♂. It occurs on the Upper Amazons. Here, the pale spot of the fore wings, rather whiter than in the type, is removed to near the outer margin of the wing and is prolonged into a belt. Other varieties are before me, showing the belt arising nearer to the middle of the hind margin; these intermediate forms occur at Ega, and lower down the river at Villa Nova. Examples agreeing with the ♂ but none with the ♀ of the true *Ariarathes* have been found on the Upper

Amazon. I found examples of a ♀ in company with *Cyamon*, at Ega, destitute of white spot on the fore wing, which I consider the ♀ of *Cyamon*. I add a description of it:—*Cyamon* ♀. Somewhat smaller than ♀ *Ariarathes*. Wings black, apical half of fore wing much clearer, fuscous. Fore wing, above, immaculate; beneath, with two deep-red spots at the base. Hind wing, above, with a belt composed of five elongate red spots, of which the anal one is geminated, the central one sometimes extending into the cell; beneath, the same spots paler in colour, and with two deep-red spots at the base. Rest as in *P. Ariarathes*. Two specimens taken at Ega.

Var. *Gayi*, Lucas ♂. Also an extreme var. of the ♂. I obtained a single example at Ega, which I have compared with the typical specimen of *Gayi* in the Collection of the Jardin des Plantes, at Paris. The spot of the fore wing, darker and clearer cream-coloured than in *Ariarathes*, is large and sub-quadrate in form, and situated nearer to the base of the wing on the hind margin. The red macular belt of the hind wing is reduced to two spots, viz.: one, the usual twin spot at the anal angle, and another a little removed from it. The rest as in the *Ariarathes* ♂. The Parisian specimen was obtained from Cusco, in the south of Peru, doubtless from the humid forests of the Upper Ucayali near there, which are continuous with those of the Teffé, where mine was captured.

Var. *Evagoras*, Westw., Gray, ♂ and ♀. This form was described from specimens taken in Venezuela by Dyson, having been first referred erroneously by Doubleday to the *Ilus* of Fabricius. The ♂ differs in no essential point from the ♂ of the *Ariarathes* type. The ♀ is rather more distinct, the spot of the fore wings being dusky cream-coloured instead of white. The character offered by the red belt of the hind wing extending into the cell, as given in Gray's figure, is not of specific importance, as it occurs in individuals of several other species of this and allied groups. Males agreeing with *Evagoras* have been taken on the Rio Negro in the Amazon region, and I found the form also at Ega. It is a curious fact, that most of those ♀ *Papiliones* which, towards the mouth of the Amazon, have a large white spot on the fore wing, show a tendency to lose it in localities higher up the river, or in Guiana, as we shall see presently in *P. Hippason* and *P. Lysander*. In some species, indeed, the white spot changes in some of the individuals to a dusky yellowish tint, as well as disappearing altogether in others. In the present species we see the ♀ has lost the spot in ♀ *Cyamon*, and has changed the colour of it in ♀ *Evagoras*. The same takes place in *P. Patros* of Gray, as will be seen in treating of that species.

P. Hippason ..... ♂, Cram. 29 E. ♂ (*Hippason*).
♀, ib. 269 A. B. (*Amosis*).

Local var. *Paraensis*, nob. ♂ and ♀, Gray Cat. B. M. p. 58, pl. 10, f. 3 (*Hippason*, var. b. ♀).

P. Hippason occurs in the Amazon region only as a local variety of the Surinam type, as figured by Cramer. But the variety is shown distinctly only in the female sex, as in other species of *Papilio*. The gray and white spot of the fore wing of the ♂ differs much in examples from one and the same locality. The ♀ of the Surinam type, so far as we know, has spotless fore wings; in the *Paraensis* it has *always* a large rounded white spot in the centre. It is only found in the neighbourhood of Pará, where it frequents the borders of the luxuriant, humid forest to the N.E. of the city. It flies very rapidly, but is not very difficult of capture on account of the fearlessness with which it allows itself to be approached when settled on foliage. It is a strikingly handsome species, distinguished from all its congeners by its peculiarly straight antennæ, and is interesting as having no other species nearly allied to it, and being confined in its range to Guiana and the Delta of the Amazon.

Group 4. *P. Anchisiades*, and allies.

This group approximates in the character of the slenderness of the antennæ to the great *Æneas* group of Tropical American *Papiliones*, and indeed might be included therein, did it not contain a number of species of peculiar facies (*e. g.*, *P. Pharnaces*, Dd.; *P. Photinus*, Dd.; *P. Thymbræus*, Bdv., &c.), which would not harmonise well with the other species. They have not, either, the ample abdominal wing-fold so characteristic of the group mentioned. They are allied, in this and other respects, to *P. Torquatus* of the *Thoas* group. They are not true forest butterflies, like the *Æneas* series of species; they frequent merely the skirts of the woods and congregate on the moist margins of water. *Anchisiades*, and some of its varieties, are the only forms found on the banks of the Amazon.

P. Anchisiades .....Esper, Ausl. Schmett. t. 13, f. 1, 2. Cram. 318 A. B. C. D. (as *Anchises*, Lin).

Local var. *Isidorus* .. ♂ Doubld. Ann. Nat. Hist. xviii. (1846), p. 374. Gray, Cat. B. M. p. 64, pl. 5, f. 1.

This is a very variable species, at least in some localities. On comparing a series of examples of the allied form *Idæus*, Fabr., from different localities with the present, I think it would be difficult to find characters constant enough to separate them as two species; one form or other of the two occurs over a wide extent of country, from Rio Grande in 32° S. lat. to Mexico, in 16° N. lat. The varieties found in the Amazon region, however, I will refer to the *Anchisiades*, taking Cramer's figures as the type. In the typical form both sexes have a large, rounded, dull white spot on the fore wing, and a broad belt of four elongate red spots on the hind wing; the dentations of the hind wing are of equal size, and the three marginal sinuses nearest the angle are tinged with rose colour, the rest being bordered with white. Very few of the examples found by me on the Upper and Lower Amazon agree with the type in these characters; but the individuals vary in one and the same locality. The following are some of the varieties.

Var. a, ♂. Marginal sinuses all bordered narrowly with white, that at the anal angle only being spotted with rose colour. White spot of fore wing reduced in size, being enclosed between the post-median nervure and the first median nervule. Santarem, Lower Amazon.

Var. b, ♂. Hind wing very much produced towards the anal angle and the whole outer margin scarcely convex. Marginal sinuses all bordered with white. Ega, in company with the type.

Var. c. *Isidorus*, Dd., ♂. The example before me is only an approximation to the *Isidorus*, Dd. The fore wing above is immaculate. The hind wing has the dentation at the third median nervule much more produced than the others. The sinuses are all edged with white. The red belt of hind wing is similar to that of the type, but much smaller. Beneath, the fore wing has a large dusky-white spot, half way between the median nervure and the hind angle, divided by the first and second median nervules; the hind wing has, in the place of the red belt of the upper surface, a series of four spots, of which the two central ones are large, and pinkish-white in colour, the outer one very small, of same colour; the inner one rounded and rose-red; all four are accompanied on the upper side by a small rose-red spot. There is also a row of three similar red spots between them and the costal edge of the wing. *P. Isidorus* differs a little from this variety, but only as a further divergence from the type; it was found in Bolivia. My specimen I took at Ega, in company with the type, *Anchisiades*. *P. Idæus* occurs in the south of Brazil; other inconstant forms occur in Honduras and Mexico, some of which have not yet been described either as species or varieties (e. g. *P. Pandion*, Bdv., of the French collections). I bred *P. Anchisiades* from

larvæ feeding on the orange tree at Santarem ; the larva is figured by Stoll, pl. 1, f. 2.

Group 5. *P. Æneas*, and allies.

This, the most numerous group of American *Papiliones*, is distinguished from all the others by several important characters. The antennæ are very long and slender ; gradually thickened and strongly curved upwards, at the tip : the abdominal fold of the hind wings is very strongly developed, soft in texture and turned upwards, enclosing generally a mass of silky, down-like pubescence. The style of colouration is very similar throughout the whole of the species ; viz., black ground, with white or green spots on the fore wing, and crimson or yellow belts or spots on the hind wing. In habits they all agree in being exclusively frequenters of the shades of the forest. They are peculiarly the creatures of those vast, varied and humid forests which clothe the wide-spreading equatorial plains and every sweltering river-valley of tropical America, from the river Plata (about 28° S. lat.) to Mexico (about 16° or 18° N. lat.). Southern and Central Brazil yield five species, Columbia with Peru about thirteen, Central America and Mexico about five ; whilst the Amazon valley with Guiana yield about twenty-two, most of which are exclusively found there. I believe no species has hitherto been found in the West Indian Islands (Trinidad, which is supposed to yield one, must be considered merely a detached portion of the main land) ; and of the seventeen Cuban species of *Papilio*, enumerated by Lucas in Sagra's "Histoire de Cuba," no one belongs to this group. In the forests of the Amazons they abound both in species and individuals, each of the subdivisions of the country yielding its peculiar species and local varieties. They are of rather slow flight, and are generally seen threading their way amongst the lower trees and bushes in the more humid and luxuriant parts of the forest, being most abundant in the periods of the year between the dry and the wet seasons. Sometimes they mount to considerable elevations, attracted by the conspicuous flowers of climbing plants. The females always fly nearer the ground, and slower than the males ; depositing their eggs, in passing, on the underside of the leaves, one on a leaf, of low plants. They are not related closely to any other group of *Papiliones* either of North America, or any part of the Old World ; their nearest alliance is through the South Brazilian *P. Dardanus*, with the *Agavus* group, which is found nowhere but in the south of Brazil, and, although of very different facies, shows in its colouration and in the ample abdominal fold of the males a proximate relation to the present. The group is essentially American ; showing, like the Platyrrhine Monkeys, the arboreal *Edentata*, the *Toucans*, the *Cracidæ*, &c. in the mammals and birds, the features of South American organization, its distinctiveness and its adaptation to a forest country of enduring continuance and vast extent. The sexes differ very much in colours, and the females are generally more subject to vary than the males ; in consequence, mistakes have been made by almost all the authors who have written upon them, and the nomenclature is in a very confused condition. The colour of the fringe in the sinuses of the wing-margins is an important character and very useful in the elucidation of the species ; I shall class the species according to it.

Section 1. Fringe of the wings white or yellowish.

P. Sesostris ..... ♂, Cram. 211 F. G. and authors.
♀, Ib. 277 C. D. (as *P. Tullus*).
♀, Gray, Cat. B. M. p. 58, pl. 5, f. 2 (as *P. Cutora* ♀).

The male of this beautiful species does not vary in the slightest throughout the country which I explored, through 22 degrees of longitude, from Pará to Tabatinga ; being always conformable to the Surinam type as figured by Cramer ; but 6 degrees further west, on the Napo, near the foot of the Andes, it begins to vary ; specimens from there showing the commencement of an elongate crimson spot, near the abdominal edge of the hind wing. These are found in conjunction with

a still further divarication from the type, viz., the *P. Childrenæ*, Gray (Griff. An. King. pl. 38, f. 1, 2; *Œdippus*, Lucas, Voy. de Cast. Lep. pl. 2, f. 4), and also with the typical *Sesostris*. *P. Childrenæ* in the valleys of the Andes near Bogotá, becomes the prevailing form; indeed, I have seen large numbers of it in collections from there, unaccompanied by a single individual of the type. Another variety, differing from *Childrenæ*, occurs further northward in Honduras, the ♀ of which only has been figured (*Zestos*, Gray, loc. cit.).* The female varies a little in the breadth of the crimson belt of the hind wing, in the presence or absence of a spot between the third median nervule and the lower discoidal nervure, and of a similar spot between the upper discoidal and the costal nervures of the hind wing. The cream-coloured spot of the fore wing also varies a little in size and shape but not in position. In the Honduras var. *Zestos*, the spot undergoes a more considerable alteration (fig. loc. cit.). *P. Sesostris* is the boldest flier of the group; but I have never seen him out of the forest shades.

P. Vertumnus ..... ♂ Cram. 211, A. B.

Var. ♀ Gray, Cat. B. M. p. 48, pl. 11, f. 4 (as *P. Diceros*).

Var. ♀ (Bdv.) Lucas, Rev. and Mag. Zool. 1852, p. 489 (as *P. Phronius*).

Var. ♀ Gray, Cat. B. M. p. 48, pl. 8, f. 6 (as *P. Cixius*).

Var. ♀ Bdv. Sp. Gen. Pap. No. 117 (as *Cœlus*).

Local Var. *Cutora*, Gray, ♂ Gray, Cat. B. M. p. 58, pl. 10*, f. 6.

If we except the strongly marked variety *Cutora*, the ♂ of this is subject to no great variation from Pará to the Peruvian frontier. The so-called var. fig. C. of Cramer has not been found on the Amazon. The true *Vertumnus* varies only in the presence or absence of a white speck in the green patch of the fore wing, and of a fourth opalescent crimson spot in the hind wing. But the ♀ varies so much that it is difficult to find two individuals alike. What I consider to be the typical or most usual form of the sex has not been described; but it agrees with the figure of *P. Diceros* of Gray, except that the crimson band is not sub-opalescent. The white spot of the fore wing varies from the large, irregular patch of the var. *Cœlus*, to the small quadrate spot of the var. *Cixius*. The crimson belt of the hind wing, in some examples sub-opalescent, is sometimes narrower sometimes broader; sometimes consists of five spots with indications of a sixth, but generally of only four. The dentations of the hind wing, also, vary very much in size, sharpness, and prominence, the central one being sometimes longer than the others. The true *Vertumnus* appears to be confined to Guiana and the Amazon region. At Surinam it shows a strongly marked var. (the fig. C. Cram. t. 211), which extends into Columbia, and is *P. Telmosis*, Bdv. Col. Towards the frontier of Peru in the Amazon region, it shows a variety of quite a different nature to *Telmosis*, the *Cutora* of Gray. In the Andean valleys of New Granada it is represented by (or perhaps becomes changed to) the *P. Pyrochles*, Doubled. (Gray, Cat. pl. 9, f. 2), but in some part of the same country it shows a nearer resemblance to its type, as in *P. Phaenon*, (Kollar, Beitr. N. Gr. t. 1, f. 5, 6). In the *P. Zeuxis* and in several undescribed varieties from New Granada, there appears to be a transition between the forms resembling *Vertumnus* and those resembling *Proteus*, whilst

* There is a ♂ example in the B. M. Coll. from Honduras, which seems intermediate between *P. Sesostris* and *P. Childrenæ*; it has a narrow crimson spot on the hind wing between the abdominal margin and the first median nervule. It may be considered the ♂ of *Zestos*. Examples occur from New Granada and the Napo. The green spot of the fore wing is as in *P. Sesostris*.

at Pará, *Vertumnus* keeps itself perfectly distinct from, although existing in the same forest with the form there representing *P. Proteus*, viz. the *P. Hierocles*, Gray. *Vertumnus* is found in the humid forests near Pará, generally in company with *P. Æneus*, flying slowly: on the Upper Amazon it delights to settle on the moist margins of the rivulets which there flow through every ravine in the forest, where in the chequered shade many of the most beautiful forest butterflies love to congregate, as *P. Crassus*, *Pieris Lorena*, *Eubagis Persis* and many others.

Local var. *Cutora*, Gray, loc. cit. This form has a very different aspect from the type, on account of the peculiar colour of the spot of the fore wing, which is yellowish-olivaceous instead of green. In the example before me the opalescent crimson spots of the hind wing are only two in number, and, beneath, are *yellow* in colour; the fringe also is yellowish. Had it occurred in numbers in its locality, to the exclusion of the type, I should have treated it as an independent or fixed form of its group. It is found on the Upper Amazon only, at Ega and St. Paulo, in company with the type but much rarer. I have an example of a ♀ from Ega, which I consider to be the ♀ of *Cutora*; I add a diagnosis of it. *P. Cutora* ♀. Size and form of *P. Diceros*, dentations of the hind wing much less acute. Fore wing immaculate above and beneath, and of a fuscous colour. Hind wing with a sub-opalescent crimson belt, similar in form to that of *P. Diceros*, but wanting the outermost spot: the belt beneath pale rose colour.

P. Hierocles ♂, Gray, Cat. B. M. p. 55, pl. 10, f. 2.
♀ ib. p. 55, pl. 9, f. 9 (as *Hierocles* ♀).
?♀ ib. p. 56, pl. 10, f. 6 (as *Aglaope* ♀).
♀ ib. p. 52, pl. 10*, f. 7 (as *Thelios*).
♀ ib. p. 49 (as *Cyphotes*).

The ♂ is tolerably constant to the type as figured by Gray. It varies, as do all the species of the group, in the greater or less prominence of the dentations of the hind wing: the opalescent crimson macular belt of the hind wing varies in breadth, and the number of spots of which it is composed varies from three to five. In some individuals the belt is in the same position as it is in examples of the *P. Proteus* of Rio Janeiro. The ♀ varies more than the ♂. The white spot of the fore wing varies in size, but it is always of a clear white. The crimson belt of the hind wing consists of five or six spots (the anal one sometimes geminated) rather widely separated; sub-oval in shape, varying in size, the second and third always the largest, the fifth often large and rounded: it crosses the wing in the same position as the macular belt of the ♂. The range of the species is restricted to Pará. It will probably be found also in the other northern provinces of Brazil, and must be looked upon as the representative in these regions of the *P. Proteus* of Rio Janeiro. It flies in the same forest as its ally *P. Vertumnus*, but prefers the dryer areas, where the soil is light and sandy, *Vertumnus* being found more in the lower and moister districts. They keep themselves perfectly distinct, and no instance of hybridity has come under my notice. The forms of this group resembling *Proteus* are numerous, and taken together have a wide range. At Corrientes, on the Plata, beyond the tropics, a magnificent form occurs, *P. Orbignyanus*, Lucas; in Bolivia and in the forests of Peru, east of the Andes, *P. Erlaces*, Gray (Cat. B. M. pl. 8, f. 9). In Venezuela there is a beautiful representative, viz. *P. Erithalion*, Boisd. (Gray, 10*, f. 3 and 4); in New Granada, *P. Serapis*, Boisd. (Sp. Gen. t. 1 B. f. 2), which comes nearer our *P. Hierocles*. In Honduras there is *P. Iphidamas*, F. (Gray, pl. 8, f. 1 and 2), and in Mexico, *P. Panares*, Gray (pl. 10, f. 4), of which *P. Alector*, Bdv. MSS., is probably the ♂. Lastly, in the east, probably in the Island of Trinidad, there occurs *P. Cymochles*, Dd. (Gray, pl. 10, f. 8). No representative has as yet been found in Guiana,* or

* Since writing the above I have acquired a specimen of a *Papilio* from Demerara, which resembles *P. Telmosis* (Cram. 211 C.), but also approaches in many points *P. Hierocles* of Pará, and *P. Erithalion* of Venezuela. I add a brief de-

in any part of the Amazon region except the neighbourhood of Pará. In its habits it resembles *P. Vertumnus*, and is never seen out of the shades of the forest.

P. Æneas ♂, Lin. Rœsel, Ins. ix. t. 2, f. 2 (*Æneas*).
Cram. 279 C. D. (as *Æneas*, L. ♀).
♀, Hübn. Samml. Ex. t. 121 (as *Marcius*),

This species offers no notable variation in either sex. It is, at the same time, of very limited range, having been found only in Guiana and the southern part of the Delta of the Amazons, at Pará. In the latter district it is always found in company with *P. Vertumnus*.

P. Bolivar ♂, Hewits. Tr. Ent. Soc. 1851, p. 97, pl. 10, f. 2.
♀, Gray, Cat. B. M. pl. 10, f. 7.

From Pará to the mouth of the Rio Negro neither *P. Æneas* nor any form resembling it occurs; but on the Upper Amazons, at Ega, there is found the present species, apparently very distinct from *Æneas;* but from the similarity of its habits, and from the fact that in all its marks of difference analogous cases are offered by other local forms, which from having them less in degree are considered as mere varieties of their type, I am inclined to consider it as a geographical variety of that species. At Pará, *P. Æneas* flies in company with *P. Vertumnus;* in the same way *P. Bolivar* has this species for companion at Ega; but *Vertumnus* has only changed in some individuals (*P. Cutora*), whilst *Bolivar* has totally varied from its type. *P. Cutora*, however, in the points where it differs from *Vertumnus*, differs in the same direction in which *P. Bolivar* does from *P. Æneas;* viz. the green spot of the fore wing changes to olivaceous, and the red spot of hind wing beneath to yellow; the contrast in colour, however, being more strongly marked in the one than in the other case. The ♀ has changed from the ♀ *Æneas* far more than has the same sex in *Cutora* from its type; but only in the substitution of yellow for crimson on the hind wings, a change of colour which we shall see has a tendency to occur in other species (*P. Patros*, Gray). Some note should also be taken of the greater isolation of *P. Bolivar* in its geographical relations to its type, and also of the important fact, which a close study of species in natural history will reveal, that species differ immensely amongst each other in their susceptibility of change. Susceptibility of change, power of adaptation with or without change to new local circumstances, are qualities or characters of species, just as much as bodily structure or peculiar instincts. The subject of "representative species" was constantly forced on my attention during my travels. After becoming thoroughly familiar with the productions of one region during several years' residence, I have at different times, removed to another several hundred miles distant, and have been then obliged to notice the changes of appearance that many of my old friends had put on; some more, others less; whilst some had assumed quite the form of new and distinct species. It is not, however, all the allied species thus representing each other that can be considered in the light of having varied the one from the other; there are cases in which two such

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scription of it. *P. Phosphorus*, nob. ♂. Shape of *P. Hierocles*, the opalescent crimson macular belt of the hind wing consisting of four spots (with a fifth very minute), placed exactly as in examples of *Hierocles;* fore wing with a broad, short, triangular grey-green spot in the middle of its hind margin, the apex nearly reaching the second median nervule, and having two minute white specks in it, one behind the second, the other behind the first median nervule. Demerara. This insect is especially interesting as serving to connect still closer the forms between *P. Vertumnus* and *P. Proteus*. If the presence of connecting links obliges us to sink two species into one, these two forms ought to be considered as one species, that is, one of them as a local modification of the other; how is it then that one of the local varieties, *Hierocles*, presents the most distinct attribute of a true species, in associating with *Vertumnus* without amalgamating with it?

species occur together over a wide district on the frontiers of their respective regions without amalgamating or showing any intermediate forms. In some cases the differences between the two are much more strongly marked than in others; and then we must seek for other causes of their origin than the operation of local conditions on one and the same species in distant points of its present area of distribution.

P. Triopas, Godt. Encyc. Méth. ix. p. 33, No. 23.

This is another species of confined range. It occurs only in Guiana, at Pará and on the Lower Amazon. I found it chiefly at Pará and Obydos. It has been generally placed in classifications far away from the present group, but an examination of its antennæ and the abdominal fold of the ♂ will show at once that this is its right position. Indeed, this and the following, I look upon as the culmination of the type of the group. In a group of the *Papilio* genus, where the effects of a confined forest habitat are seen in many points of structure, as well as in the enfeebled powers of flight, these two species show these characteristics to a greater extent than any of their congeners. The female flies near the ground and very slowly, but the male takes a higher and rather bolder flight.

P. Chabrias, Hewits. Tr. Ent. Soc. 1852, pl. 6, f. 1, ♀.

The ♂ has not been figured. It agrees in colour and markings with the ♀. It is found exclusively on the Upper Amazons, where no example of *P. Triopas* has occurred, and I consider it a geographical modification or sub species of the latter, in the same way as *P. Bolivar* is of *P. Æneas*.

P. Orellana ♂, Hewits. Tr. Ent. Soc. 1852, p. 24, pl. 5, f. 2.

This most beautiful and distinct species has the same glossy steel black ground colour of the wings as *P. Panthonus*, Cr. The latter, however, has a rose-coloured fringe, whilst the example of *P. Orellana* has, although it is scanty and obscure, a white fringe. It is, therefore, a species which has no near ally in any part of tropical America. I found only one individual during a four years' stay in the district, at Ega, on the slopes of a luxuriant ravine in the forest, flying in company with *P. Sesostris* and *P. Lysander*.

Section 2. Fringe of the wings rose-coloured.

P. Aglaope ♂, Gray, Cat. B.M. p. 55, pl. 10, f. 5, ♂.

The ♀ would be similar to the fig. 6, pl. 10, of Gray, if the fringe were rose-coloured instead of white; but I have not seen any ♀ which I could refer to this species. The ♂ is nearly allied to *P. Euristeus*, Cr. (t. 29 F.), and to *P. Panthonus*, Cr. (278 C. D.); all three belonging to the rarest of neo-tropical *Papiliones*. *Aglaope* was taken at Pará; I have only seen two examples of it, one in the B. M. Collection, and one in my own.

P. Lysander ..... ♂, Cram. t. 29 C. D. (*Lysander*).
— *Eurymas*, Godt. and Boisduval.
— Gray, Cat. B. M. p. 53, pl. 8, f. 7 (as ♂ of *Brissonius*, Hübn., the fringe white, by error of colourist).
♀, Cram. 386 C. D. (as *Arbates*).
— Hübn. Samml. (as *Arbates*).
— Boisd. Sp. Gen. Pap. No. 118, part (as ♀ of *Panthonus*).
— Godt. Encyc. ix. Pap. No. 31 (as *Anchises*, L.).

P. Lysander ..... ♀, Hübn. Samml. (as *Pompeius*, corrected in his Verz. to *Brissonius*).
— Gray, Cat. B. M. pl. 8, f. 8 (as ♀ of *Brissonius*, Hübn.).

Local var. *Parsodes*, Gray, ♂, Gray, Cat. B. M. p. 54, pl. 8, f. 3 (as *Parsodes* ♂, fringe white, by error of colourist).
♀, Gray, Cat. B. M. pl. 8, f. 4 (as *Parsodes* ♀, fringe white, by error).
— Gray, Cat. p. 57 (as *Sonoria*), and pl. 10, f. 1 (as *Sonoria*, var.).

The ♀ of this species, like those of *Ariarathes*, *Hippason*, *Vertumnus* and others, varies in the white spot of the fore wing, which is sometimes wanting altogether. This, together with its proper mate being unknown, has given rise to much confusion in the synonymy. The varieties of the ♀, however, are nearly constant according to locality. The Surinam form has generally an obscure small white spot; at Cayenne a great many have the same spot (Jardin des Plantes, as *Panthonus* ♀), but there occur others with a larger spot divided in two by the 2nd median nervule (Boisd. Sp. Gen. p. 290). On the Upper Amazon every ♀, without exception, is spotless; at Villa Nova, on the Lower Amazon, most of them are spotless, but there occur a few with a slight trace of white spot. At Pará and on the Tocantins, where the species abounds, every individual has a very large white spot, almost always entering the cell. As the male in the latter locality shows generally a broader and brighter green spot of the fore wing, it is here treated as a local sub species of *Lysander*, and may be considered as a tolerably constant and fixed form. The spotless, or small spot ♀, has generally been considered as the ♀ of *Panthonus*. *Panthonus*, however, does not occur on the Amazon. I have seen examples of both sexes from Demerara, the ♀ resembles closely the ♂, and can very readily be distinguished from *Arbates* by the shape of the red spots of the hind wing. The *Arbates* of Cramer is decidedly *not* the ♀ of *Panthonus*. *Lysander* is found very abundantly at Ega and St. Paulo on the Upper, and at Villa Nova on the Lower, Amazons. *Parsodes* is confined exclusively to the district of Pará. They prefer the most humid parts of the forest, and fly heavily. *Parsodes* especially delights in the swampy palm groves which clothe the numberless islets at the mouth of the Tocantins.

P. Echelus, ♂, Hübn. Samml.
♀, ib. (as *Echemon*).
Var. ♀? Gray, Cat. p. 55, pl. 10*, f. 1 (as *Spartacus*, Dd.)

This species appears to occur in no other country except the lower part of the Amazon. It is the commonest of all the species of its group at Pará, and reoccurs at Santarem, on the southern shore of the Lower Amazon, but less abundantly. On the northern shore, at Serpa and Barra, it is represented by *P. Ergeteles*. At Cayenne, however, there occurs a form intermediate between the two, as will be mentioned presently. *Echelus* prefers the drier districts in the forest, and flies in company with *P. Hierocles*. It delights to settle on flowers, especially the pendulous spikes of flowers of Combretaceous plants, which hang from the overarching trees in the narrow alleys of the forest near Pará.

P. Ergeteles ♂, Gray, Cat. B. M. p. 52, pl. 8, f. 5.

The following is a diagnosis of the ♀, from a unique specimen in my collection:—*P. Ergeteles* ♀. Similar to *Echelus* ♀. Fore wing much more pointed, having in its centre a rounded, dingy white spot, dusty round its edge, and divided by the second median nervule. Hind wing with a crimson belt, much broader

and less distinctly macular than *P. Echelus*, composed of six spots, of which two smaller, anal; the next three much elongated, like the corresponding ones in the ♂, and the sixth small, triangular. The rest as in *P. Echelus* ♀. This beautiful insect, apparently so distinct, takes the place of *Echelus* on the north shore of the Amazon, but it does not pass apparently the Rio Negro to the west. It is evidently a local sub-species of *Echelus*. At Cayenne there occurs a form, apparently intermediate between the two; but the individuals there vary considerably amongst themselves, like species in process of transition. I add a description of it in a note, from two examples which I obtained lately in Paris.*

P. Æneides ♂, Esper, Ausl. Schmett. t. 15, f. 3, ♂.
Cram. t. 279 A. B. (as *Æneas*, Lin. ♂).
♀, Gray, Cat. B.-M. p. 51, pl. 9, f. 8 (as *Æneides*, ♀).

This species occurs in Guiana and on the Lower Amazons. At Pará, where *Echelus* is so common, it is not found at all, but is extremely plentiful on the Tocantins. It reappears at St. Paulo, near Peru, as a well-marked local sub-species. Its habits are those of *Echelus;* it frequents rather the high and dry parts of the forest, but yet those where there is an alluvial soil, especially delighting in the cacao groves, and the wildernesses of second growth forest usually found in their vicinity.

P. Olivencius, nob.

♂. Size, shape and ground colour of wings as in *P. Æneides* ♂. Fore wing with a large sub-triangular, greyish-green spot, nearly touching the hind margin about the middle, its apex reaching the second median nervule. Hind wing with a large crimson palmate spot as in *P. Æneides*. ♀. Fore wing spotless. Hind wing with a belt of pale carmine spots, six in number, extending in a waved line across the wing, a little behind the cell; the spots are nearly equal in size, similar in length to those of *Echelus* ♀, but much more widely separated by the intervening nervures. This sub-species or local form of *P. Æneides* is abundant at the village of St. Paulo de Olivencia, near the frontier of Peru. I have also seen an example of it from Bogota, in the Hopean Collection at Oxford. At St. Paulo it is constant to the characters given above. The most westerly point of the range of the typical *Æneides* is Obydos, 13½ degrees of longitude to the east of St. Paulo. Between the two stations no form resembling either occurs. *P. Æneides*, like *P. Proteus*, is a form which seems to have spread over the whole of tropical America, but presenting in different regions well-defined and constant local forms, which have been treated by authors as distinct species. Thus, in the plains of Bolivia, south eastward of the locality of *P. Olivencius*, there occurs *P. Eurybates* (Gray, Cat. p. 51, pl. 9, f. 1). Westward of the Andes, at Guayaquil, it presents us the form of *P. Timias* (Gray, Cat. p. 50, pl. 9, f. 5). Northward, on the Orinoco, it occurs as *P. Agathocles* (Kollar, Beitr. Ins. f. New Gran. p. 2). Further north, beginning in the east at Berbice, in Guiana (Cram. t. iv. p. 199), it spreads through Venezuela and New Granada as *P. Eurimedes* (Cram. 386, E. F.).

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* *P. Echephron*, nob. ♂. Size, shape and ground colour of the wings as in *P. Echelus*. Fore wing strongly produced at tip, as in that species, with a green spot between the sub-median nervure and the second median nervule, divided into two unequal ones by the first median nervule; beneath *immaculate*. Hind wing with a large crimson spot, divided by the median nervules into four, of which the first, second and third are very much more elongated than in *P. Echelus*. I obtained one example from Dr. Boisduval and one from a dealer at Paris, and was informed they were sent from the interior of French Guiana by M. Bar. I should consider this to be the *Opleus*, Godt., did he not distinctly say the fringe in that species was white.

In Nicaragua and Mexico it recedes further from the type, as *P. Mylotes** (Gray MSS.). The species of South and Central Brazil (*P. Zacynthus* and *P. Orsillus*) appear rather further removed from the type, but still are probably only further modifications of the same common form.

P. Zacynthus .. ♂, Fab. E. S. iii. 1, 15, 46.
♀, ib. 16, 47 (as *Dimas*).
Var. *Polymetus* ♂, Godt. Encyc. ix. 35, 28.

There is an example of the variety *Polymetus* in the British Museum Collection, said to have been taken by me at Pará. I have no recollection of having taken it and have seen no other Amazonian specimen. On this account, and from the fact of the form being probably confined to South-Eastern Brazil, I think it likely some mistake has occurred regarding the derivation of the specimen.

P. Orsillus, Gray, Swainson, Zool. Illustr. 1st ser. pl. 92, ♂ and ♀ (as *Polymetus*, Godt.)

This is the North Brazilian form of *Zacynthus*, and is the prevailing species at Pernambuco. It extends also to the middle and lower parts of the course of the river Tapajos, a southern affluent of the Amazons. It certainly does not occur in the alluvial plains of the main river.

Group 6. *P. Thoas*, and allies.

The antennæ in this group are moderately long and slender, with an elongate, gradually-thickened club. The males sometimes differ from the females strongly in colouration. They have generally spots or belts of an ochreous-yellow colour on an olivaceous or fuscous black ground colour of wings. Although they are "swallow-tails," they differ greatly from the *Machaon* and *Podalirius* groups of the genus; and they are more immediately connected through *P. Torquatus* with the *Anchisiades* group of American *Papiliones*. Their habits are in perfect contrast to those of the preceding group. They are never seen at home in the shades of the forest, but prefer the open country, the gardens and plantations near the towns and villages, and the borders of the forest. They fly boldly and sometimes soar to great elevations. The females settle on flowers on the borders of the forest. The species, as might be inferred from their more locomotive habits, are of more extensive range than the *Æneas* group, some one or more of them being found from Chili to the southern parts of the United States; they are abundant too in the West India Islands, which appear to be the focus of the group.

P. Polycaon ♂, Cram. 203 A. B.
♀, ib. 16 C. D. (*Androgeus*), and var. ib. 204 A. B. (*Piranthus*).

Common in open places throughout the Amazon region. Both varieties of the ♀ occurred. The species is found from the south of Brazil to Cuba.

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* *P. Mylotes*, Gray, List Lep. B. M. No. 258. As the species has not been described, I add a short diagnosis. ♂. Size, shape and ground colour of wings as in *P. Eurimedes* ♂. Fore wing with a large triangular spot behind the median nervule, connected at its apex with a smaller one lying across the cell towards its apex, green, with two rather large cream-coloured spots terminating it, one of them between the second and third median nervules, the other lying across the cell. The base of the green spot lies between the first median nervule and the post-median nervure. Hind wing with a carmine palmate spot as in *Eurimedes*. ♀. Similar to ♀ *Eurimedes*, an oblong cream-coloured spot lying across the middle of the wing, traversed by the median nervure and third median nervule. Hind wing with a very broad belt, pale carmine, crossing the wing, *close behind the cell*; it consists of five elongate spots, the intersecting nervures very faintly indicated, and it does not enter the cell. Nicaragua, from M. Delattre's Collection.

P. Lycophron ♂, Hübn. Samml. Ex.
♀, Boisd. Sp. Gen. 358, 201, Lucas in Sagra's Hist. de Cuba, pl. 16, f. 1 (as *Pirithous*).

I found this species only at Cametá on the Tocantins, flying rapidly in an orange grove, in company with *P. Thoas* and others. The example before me is much smaller than those from other parts of Brazil, and the lunules of the sub-marginal row on the hind wing are much smaller than represented in Hübner's figure. The species occurs from the south of Brazil to Cuba. It offers in some countries well-marked local varieties, one of which is the *P. Hippomedon*, Felder, Lep. Fragmente, p. 25.

P. Thoas, Linn. Cram. 167 A. B.

This common neo-tropical species is subject to much variation. One of the varieties is understood to prevail in the northern part of its range, viz., the West India Islands and the southern parts of the United States, as *P. Cresphontes*, Cr. (165 A. B. and 166 B.), but I do not know whether it is sufficiently well marked and constant to be considered as a well defined sub-species. In the Amazonian region *Thoas* is found only about the Delta of the river. In Pará specimens the sub-marginal lunules of the hind wings are much more rounded and obtuse than in Cramer's fig., or in Bogotá examples before me. On the Upper Amazons it is wholly replaced by the following.

P. Cinyras, Ménétriés, Cat. de la Coll. Imp. Ac. &c. de St. Petersburg, p. 111, t. 7, f. 3.

This well-marked and fixed local form, whose "specific rights" have given rise to much useless controversy in some Entomological journals of Germany, first appears in ascending the river, at Villa Nova. I neglected to notice whilst I resided there, whether it was the *exclusive* form of *Thoas* in the locality. At Ega, however, I convinced myself that it was there the only form which occurred. All the individuals examined agree with the excellent figure of M. Ménétriés. It appears to occur also at Bahia (Ménétr. loc. cit.), probably in the interior of the country (Felder, Lep. Fragmente, p. 26).

P. Torquatus.... ♂, Cram. 177 A. B.
♀, Hübn. Samml. (as *Caudius*).
Local var. *Patros* ♀, Gray, Cat. B. M. p. 43, pl. 7, f. 5, 7, 8.

The male is found throughout the country and offers very little variation. The female varies very much between the Upper and the Lower Amazons. The difference is so great between the sexes that it is only the evidence afforded by having captured *P. Torquatus* and *P. Caudius* in copulâ that induces me to place them together. Every example examined shows all the individuals of *P. Torquatus* to be ♂ and all those of *P. Caudius* and *P. Patros* to be ♀. In colouration the females approach *P. Anchisiades* and species of the *Æneas* group. In their variation they show the same laws of substitution of colours which we have seen to prevail in several other species, as in *P. Bolivar*, *P. Vertumnus*, *P. Ariarathes*, &c. They are subject to change of colour of the spot of the fore wing from white to yellowish, and to lose it altogether, and to the replacement of the carmine of the hind wing by yellow. Mr. Gray figures the three varieties which occur on the Upper Amazon, where no example of the true *P. Caudius* has occurred. A feature in the habits of the female may explain why it is subject to these variations; it frequents, like the species of the *Æneas* group, the shades of the forest, coming out only on dull days to the borders. The male, although choosing the open sunlight, descends also into the sunny breaks and open glades of the forest, where I have often seen it in pursuit of the female, although I have only once detected it in copulâ.

Group 7. *P. Podalirius*, and allies.

These are generally considered as the most typical forms of the *Papilio* genus, although in some points they seem to resemble, more than any other group, the genera *Thais* and *Doritis*. They would, therefore, rather seem to be aberrant forms, and those forms which recede most from those of neighbouring genera would be more correctly held to be typical, as the *Ornithopteræ*, but especially the species of the *Æneas* group. It is the group, however, which is the most widely spread throughout the world. Besides the elongate caudal lobe and the style of colouration, they agree in the antennæ being short and slender, with a rather abrupt, thick and strongly-curved club. They all frequent the open country. The tropical species congregate in immense numbers to imbibe the moisture on the humid margins of lakes, rivers, and on muddy places generally. I have included *P. Dolicaon* and allies amongst them, although they have rather a different style of colouration and are not generally included in the group.

P. Dolicaon, Cram. 17 C. D. and authors.

Not a common species. It is found occasionally from Pará to Peru.

P. Columbus, Hewits. Tr. Ent. Soc. 1851, p. 98, pl. 10, f. 1.

This very beautiful species I discovered in November, 1849, at Cararaucu, near Villa Nova, on a sandy beach, sitting at the water's edge. I found it subsequently at Ega, but it appears to be most abundant on the banks of the rivers flowing from the northward, as an Indian trader once brought me an immense number in a spoilt condition from the river Japurá.

P. Protesilaus, L. Cram. 202 A. B. and authors.

Found throughout the country; but most abundant on the Upper Amazon, where it sometimes assembles in dense masses on the moist sand and mud on the banks of the river.

P. Autosilaus, Bdv. MSS.? Gray, List B. M. (as *Agesilaus*, Bdv.).

This species differs from *P. Agesilaus*, Bdv. (= *Conon*, Hewits. Tr. Ent. Soc. vol. 2, N. S. pl. 22, f. 3), much more than the latter does from *P. Protesilaus*. It has also the character of an independent species in being found in company with *Protesilaus* without amalgamating with it. It has not yet been described. I therefore add a short diagnosis. *P. Autosilaus* ♂. Smaller than *Protesilaus*. Ground colour of the wings of a *uniform pale greenish-white*, not deeper green towards the base, as *Protesilaus* and *Agesilaus*. Fore wing with a series of five short black stripes proceeding from the costa as in the allied species: the outer edge with a broad black margin (broadest at the apex of the wing), in the middle of which runs a narrow semi-transparent pale stripe, of *equal width*, from the costa to near the hind angle. Hind wing with the abdominal border black, and a black stripe running from the costa, near the base, to the outside of the red anal lunule. The outer border black, with a row of *simple* pale lunules along its centre. Beneath the hind wing has two black stripes across near the base, the inner one with a red spot *outside* at its base, the outer one with a broad red edge on its inner side, as in *P. Agesilaus*. I found the species at Ega, always in company with *P. Protesilaus*; out of a cluster of a hundred of the latter species settled on moist places, I could generally select one or two of *Autosilaus*, conspicuously differing from the others through the different tint of its wings.

Group. 8. *P. Zagreus*, and allies.

The unique species which I place here seems to be nearest allied to species of the *Scamander* group; but it does not consort well with any other known *Papilio*. As in *P. Pausanias*, nature seems to have perverted the usual *Papilio* form to produce the mimetic likeness of a *Heliconide*.

P. Zagreus, Doubled. and Hewits. Gen. D. L. pl. 1*, f. 1.

The species has been found in Venezuela and in New Granada. I obtained one example, at Catuá, near Ega, in November, 1850. The *Heliconide* which it most resembles is *Lycorea Atergatis*, Dbld., a species also confined apparently to the same districts of country as the *Papilio*.

Obs. Having concluded the review of the Amazonian species of *Papilio*, I think it will be useful to employ the results to illustrate further some of the subjects mentioned in the remarks at the commencement of the article; especially the interesting one of the relation of the Amazonian fauna to those of other countries of tropical America. The species are such conspicuous objects, and are so well represented in collections, that they afford good data for arriving at conclusions, which I think are not likely to be falsified by any subsequent group of which we have to treat. The simplicity and distinctness of the markings and colours also afford good characters by which to measure the amount of modification the species undergo from one locality to another. The Valley of the Amazons, as I said before, has been classed, with regard to its Zoological and Botanical productions, together with Columbia and Guiana, as forming one great province, the Columbian. On the north this is separated from the Mexican province by the Isthmus of Panama; on the west from the Peruvian by the chain of the Andes; the great Brazilian province on the south beginning from the southern borders of the alluvial plains of the Amazons.

The species of *Papilio* confirm, what however is a well-established fact, the distinctness of the Brazilian province; but I think they also afford very strong grounds for considering the Guiana region (comprised between the Atlantic on the one hand, aad the rivers Orinoco, Negro and Amazons on the other) as a perfectly independent province, possessing a peculiar character in its productions, and having a very large proportion of species peculiar to itself. I think it will also appear, that the Valley of the Amazon, from the mouth of the river to about 72° W. long. (where Columbian begin to predominate over Guiana forms), has received its fauna chiefly from this region. Of about fifty species and distinct local sub-species of *Papilio* found in the two districts of Guiana and Amazonia, I find that no less than twenty-nine are found in no other country. It is true that a large proportion of species, as far as we are at present aware, seem peculiar to Amazonia; but these are nearly all very closely related to, and some of them evidently local forms or modifications of, Guiana species. In comparing the Amazonian fauna with that of Guiana, it must be

remembered, that it is only the district of the north-eastern sea board of the latter country and the river valleys near the coast that are taken into consideration, that being the only part of the country of which we have sufficient knowledge. Strictly speaking, the northern shore of the Lower Amazons should be taken as part of Guiana, forming, indeed, the southern frontier of the region; this would reduce only, however, by one species the number peculiar to the Amazon Valley. It is interesting to notice how the numerous local sub-species peculiar to Amazonia, all show themselves to be local modifications of Guiana species; some of them (6) being confined to the Upper Amazon, and others (2) to the Delta at Pará; none of them being found on the northern or Guiana shore of the Lower Amazon. It would thus appear that Guiana is the great centre whence radiated the species which now people the low lands on its borders, at their last emergence from the sea or other waters; and that some of them, in advancing westward into the alluvial plains which occupy the wide basin of the Upper Amazon, and eastward into the apparently recent land forming the southern part of the Delta, have become modified into local sub-species. The other great centres of distribution, Columbia and Brazil, have sent but very few forms, in comparison, to people these vast river valleys. The few Columbian forms found on the Amazons (3 in number) occur only in the extreme west, from Ega upwards. The Brazilian forms (2) occur on the south shore, one indeed (*Orsillus*) does not reach the alluvial plains at all, being found only in the narrow valleys of the hilly region of the Tapajos, a southern affluent. A third form (*Hierocles*) might be considered an Amazonian modification of a South Brazilian species (*Proteus*); this occurs only on the southern part of the Delta at Pará. The following table will show these facts in a clearer light.

Species peculiar to the Amazon Valley	8*
Local sub-species „ „	8†
Species peculiar to Guiana with the Amazons	9‡
„ „ Guiana alone	5§
Total number of species found in Guiana and Amazonia	50

* *Hierocles. Bolivar. Orellana. Aglaope. Echelus. Ergeteles. Columbus. Chabrias.*

† *Olivencius. Patros. Cyamon. Gayi. Cutora. Isidorus. Paraensis. Parsodes.*

‡ *Belus. Lycidas. Vertumnus. Æneas. Æneides. Lysander. Ariarathes. Triopas. Pausanias.*

§ *Hippason. Euristeus. Bitias. Aristæus. Panthonus.*

Species peculiar to the Amazon Valley and Brazil ..	2*
,, ,, ,, and Columbia ..	3†
Total number of species common to Amazonia and Guiana	19
Total number of species common to Amazonia and Brazil	9
Total number of species common to Amazonia and Columbia	12

A bare enumeration of species without further exhibition of the degrees of resemblance gives but a very inadequate idea of the true relations of faunas. Thus of the eight species given here as peculiar to the Amazon Valley, two, *Bolivàr* and *Chabrias*, are strictly speaking but modifications, although well defined and fixed, showing the strong peculiarities of the Upper Amazon region, of *Æneas* and *Triopas*, peculiar Guiana forms. A third species, *Ergeteles*, is restricted to the Guiana side of the Lower Amazon, and might be deducted from the exclusively Amazonian species. A fourth *Echelus*, a remarkable form especially characteristic of, and almost confined to the district of Pará, is connected with the Guiana *Ergeteles* through the intermediate form of *Echephron* of Cayenne. One only *Hierocles*, can be considered as more nearly related to forms of a centre of distribution not Guianian, being apparently the Amazonian modification of the South Brazilian *P. Proteus*. Of the confessed local sub-species, the two confined to the delta of the river, *Paraensis* and *Parsodes*, are varieties of the Guianian *Hippason* and *Lysander*, and are instances of the peculiar modifying effect of the district of country near Pará. The others, all varieties of Guiana forms, are confined to the Upper Amazon, and exhibit, in the replacement of colours which constitute the variations, the same effects of local conditions there prevailing as the more fixed sub- or representative species of the locality.

From the foregoing considerations, added to what has been advanced in the observations and table at the commencement of this article, I think we may conclude that the facts derived from the study of the distribution of the species of *Papilio* tend to establish the following propositions:—1st, that the Amazon region, although showing great diversity within itself, chiefly from many of

* *Orsillus. Cinyras.*

† *Zagreus. Evagoras. Autosilaus.*

P. Varus and *P. Zacynthus* have not been included in these enumerations, from the doubts which see under the head of those species.

the species having become modified in different ways in migrating westward and eastward from a central district on the lower river; on the one hand towards the upper river, and on the other towards the delta, has received by far the greater part of its fauna from Guiana; and, 2nd, that the two countries form together one and the same independent zoological province. It is probable, however, that the distinctiveness of the Guiano-Amazonian fauna will not be so strongly exhibited in other groups, as in the genus *Papilio;* this group being better represented than many others in equatorial countries, especially in the wooded, humid regions of Guiana and Amazonia. The total number of species and distinct local subspecies known to exist there is about fifty, whilst Brazil proper has only about forty-three, and Columbia with Peru about thirty-eight. Here a result may be mentioned highly interesting, as bearing upon the question of how far extinction is likely to have occurred in equatorial regions during the time of the Glacial epoch in Geology. It has been argued,* that during this period the refrigeration of the earth extended to the equatorial regions, and enabled many species of temperate zones to pass from one to the other hemisphere. It is supposed, that at that time the climate of the equatorial plains resembled what now exists at six or seven thousand feet of elevation near the equator. It is a tolerably well established fact, that arctic forms then moved twenty-five degrees southward from their homes, and if the decreased temperature then extended to the centre of the tropics, the regions near the equator must have possessed a temperature similar to what is now enjoyed in countries near the twenty-fifth parallel of latitude. Extinction, in this case, must have been at work largely amongst the forms (if there were any) peculiar to the equatorial zone, and the present character of its fauna ought to show, in consequence, a poverty in endemic forms and unmistakeable signs, in the shape of local varieties or representative species, of a dependence, on the part of the now existing forms, on those living towards the twenty-fifth parallel of latitude; because, with the returning warmth, the extratropical species then living near the equator, would retreat north and south to their former homes, leaving some of their congeners, slowly modified subsequently by the altered local conditions, to repeople the zone they had forsaken. The present distribution of the species of *Papilio* does not support the hypothesis of such a degree of refrigeration in the equatorial zone of America, or at least does not countenance

* Darwin's Origin of Species, Chap. XI. p. 378.

the supposition of any considerable amount of extinction. The fauna of the Guiano-Amazonian region, as far as regards this genus, is in the highest degree peculiar; showing no dependence on that of the countries near either of the tropics. If now we except the local varieties (the inclusion of which would only strengthen the position), there are about forty perfectly distinct species of this genus inhabiting this region, and of these no less than eighteen * are endemic, all of them so peculiarly restricted in their range, that they are not found, nor any forms closely representing them, even at twelve degrees of latitude on either side the equator. The result is plain, that there has always (at least throughout immense Geological epochs) been an Equatorial fauna rich in endemic species, and that extinction cannot have prevailed to any extent within a period of time so comparatively modern as the Glacial epoch in Geology.

Before dismissing the genus *Papilio*, I think it will be considered a service rendered to future students if I add a list of all the published species of the most difficult group of the genus, viz., that of *Æneas* and its allies, with the chief synonymy; my endeavours to understand the Amazonian species having led me to make considerable research into the literature and natural history of the whole of the American species. As in all dominant groups; i.e. groups which seem adapted under the present conditions of existence to increase and spread; the separation into species is extremely difficult. I have found it impossible to bring forms, which have so many different grades of relationship to their next of kin, into a series of well-defined species. I have endeavoured, therefore, to read nature as I have found her, and to arrange the forms according to the amount of difference between them respectively; having regard always to the important point, whether the difference be constant or not amongst the individuals concerned. Thus, differences in one or a few individuals in a locality where the typical form prevails, I have treated as simple varieties; others of more importance, either through the increased amount of difference and the tendency to occur only in certain localities, or through prevailing amongst all the individuals in a locality to the exclusion of the type, I have considered as local varieties or sub-species. The next grade of forms, that in which

* *Lycidas. Coristeus. Hippason. Panthonus. Euristeus. Orellana. Vertumnus. Æneas. Ergeteles. Bolivar. Æneides. Echelus. Lysander. Aglaope. Triopas. Chabrias. Ariarathes. Columbus.*

the differences would generally be considered of a specific character, and which involve all the individuals in the locality, but which at the same time have all the appearance of geographical varieties, I have thought it best to treat as doubtful species. The perfectly distinct forms are introduced without a mark of doubt; they are distinct from the species, or series of doubtful species which precede them on the list, but are connected with the doubtful species which follow them. Even with this arrangement I cannot conceal from myself that the distinctions are still too arbitrary; viewed in nature the forms appear to blend into each other much more than they do in the following arrangement. Nature, as far as species are concerned, wears a false air of simplicity in all our lists and monographs. There are in some species individual differences which it is difficult not to consider as important as described varieties; the varieties too are of many degrees of importance, some of a very partial nature, others embracing a large proportion of individuals and occurring only in certain localities, which latter might be considered with almost equal justice as local varieties or sub-species. Local varieties again are sometimes of a slight nature, whilst at others assume forms so well defined that it is difficult to exclude them from the category of full species. There is no absolute, well defined distinction between these different grades of relationship, and therefore there are in the following list many forms which I consider it merely a matter of individual opinion under what category to treat them; some varieties might be considered mere individual differences, some local varieties as true or complete species, and so forth. This question, I think, is not of so much importance as certain others which might be raised concerning them. I will only add here that I have considered the series of doubtful forms related to *P. Vertumnus*, sp. 2, to end at sp. 4, beginning those related to *P. Proteus* with sp. 5. I have separated the two series of forms somewhat arbitrarily, as there is no break in the connecting links; *P. Zeuxis* of the one series being extremely near *P. Phosphorus* of the other. The extreme forms, however, of the two series, viz. *P. Panares* or *Iphidamas* and *P. Vertumnus*, are so dissimilar that I have thought it best at present to separate the two groups of semi-species which they respectively represent. Future discoveries will, no doubt, serve to link all these forms still more closely together, and it will then remain a remarkable fact that the local modification of form affects the tendency to return into the normal form, or amalgamate, when varieties thus produced are brought by natural re-distribution into contact; because *P.*

Hieroeles (one of the varieties) exists in the same locality with *Vertumnus*, without a single instance occurring of its commingling with that species.

Genus Papilio of authors.

Group *Æneas*, and allies.

Section 1. Fringe of the wings white or yellowish.

Sp. 1. *P. Sesostris* ..... ♂, Cram. 211, F. G. and authors.
♀, ib. 277, C. D. (as *P. Tullus*).
— Gray, Cat. B. M. p. 58, pl. 5, f. 2 (as *P. Cutora* ♀).

Hab. Guiana and Amazonia.

Local var. (1) *Zestos*.. ♂, Gray, List B. M. p. 70 (as *Sesostris*, d).
Bates, Tr. Ent. Soc. vol. v. N. S. p. 340, note.
♀, Gray, Cat. B. M. p. 47, pl. 10*, f. 5 (as *Zestos* ♀).

Hab. Honduras and New Granada.

Local var. (2) *Childrenæ*.. ♂, Gray, Griff. An. King. pl. 38, f. 1, 2.
Lucas, Voy. de Castenau, Lep. pl. 2, f. 4 (as *Œdippus*).

Hab. New Granada.

Sp. 2. *P. Vertumnus*..... ♂, Cram. 211, A. B.
♀, Bates, Tr. Ent. Soc. vol. v. N. S. p. 340.
var. — Gray, Cat. B. M. p. 48, pl. 11, f. 4 (as *P. Diceros*).
var. — (Bdv.) Lucas, Rev. and Mag. Zool. 1852, p. 489 (as *P. Phronius*).
var. — Bdv. Sp. Gen. Pap. No. 117, (as *P. Cœlus*).
var. — Gray, Cat. B. M. p. 48, pl. 8, f. 6 (as *P. Cixius*).

Hab. Guiana and Amazonia.

Local var. *Cutora* (3) ♂, Gray, Cat. B. M. p. 58, pl. 10*, f. 6.
♀, Bates, Tr. Ent. Soc. vol. v. N. S. p. 341.

Hab. Upper Amazons.

Local var. *Phaenon* (4) ♂, Kollar, Beitr. N. Gr. t. 1, f. 5, 6.
Hab. New Granada.

Sp. ? 3. *P. Pyrochles*..... ♂, Doubled. Ann. Nat. Hist. xiv. (1844), p. 416.
Gray, Cat. B. M. p. 46, pl. 9, f. 2.
Hab. New Granada.
var. a. Gray, Cat. B. M. p. 46.
Hab. Guayaquil.

Sp. ? 4. *P. Zeuxis*..... ♂, (Bdv.) Lucas, Rev. and Mag. Zool. 1852, p. 190.
id. Voy. de Castelnau, Lep. pl. 2, f. 3.
Gray, Cat. B. M. p. 46, pl. 9, f. 6 (a slight var.)
♀, ib. pl. 9, f. 7.
Hab. Venezuela and New Granada.

Sp. 5. *P. Telmosis*..... ♂, (Bdv. coll.?) Cram. t. 211, f. c, (as *Vertumnus*, var.)
Hab. Guiana.

Sp. ? 6. *P. Phosphorus*..... ♂, Bates, Tr. Ent. Soc. vol. v. N. S. p. 341, note.
Hab. Demerara.

Sp. ? 7. *P. Hierocles*..... ♂, Gray, Cat. B. M. p. 55, pl. 10, f. 2.
♀, ib. pl. 9, f. 9.
? — ib. p. 56, pl. 10, f. 6 (as *Aglaope* ♀).
— ib. p. 52, pl. 10*, f. 7 (as *Thelios*).
— ib. p. 49 (as *Cyphotes*).
Hab. Pará.

Sp. ? 8. *P. Erlaces* ..... ♂, Gray, Cat. B. M. p. 49, pl. 8, f. 9.
Hab. Bolivia and Eastern Peru.

Sp. ? 9. *P. Protcus* ..... ♂, Bdv. Sp. Gen. Pap. No. 128.
♀, Godt. Enc. Méth. ix. p. 37, 36 (as *Nephalion*).

var. ♀, Gray, Cat. B. M. pl. 10*, f. 8.
Hab. S. E. Brazil.

Sp. ? 10. *P. Stilbon* ..... ♂, Koll. Ann. Wien. Mus. 1839, t. 12, f. 1.
Hab. S. E. Brazil.

Sp. ? 11. *P. Orbignyanus*.... ♂, (Bdv.) Lucas, Rev. and Mag. Zool. 1852, p. 192, t. 10, f. 3.
Hab. Corrientes.

Sp. ? 12. *P. Cymochles*..... ♀, Gray, Cat. B. M. pl. 10, f. 8.
Hab. Trinadad ?

Sp. ? 13. *P. Erithalion*..... ♀, Bdv. Sp. Gen. Pap. No. 125.
— Gray, Cat. B. M. pl. 10*, f. 4.
?♂, ib. pl. 10*, f. 3.
Hab. Venezuela.

Sp. ? 14. *P. Serapis* ..... ♂, Bdv. Sp. Gen. Pap. No. 130, t. 1, B. f. 2.
Hab. New Granada.

Sp. ? 15. *P. Iphidamas* ..... ♂, Gray, Cat. B. M. pl. 8, f. 1.
♀, ib. f. 2 (as *Iphidamus*, doubtfully of Fabricius).
Hab. Mexico and Honduras.

Sp. ? 16. *P. Panares* ..... ♀, Gray, Cat. pl. 10, f. 4.
?♂, Bdv. Coll. as *Alector*.
— B. M. Coll. as *Anchises*, Lin., erroneously.
Hab. Mexico.

Sp. 17. *P. Opleus* ..... ♂, Godt. Enc. ix. p. 33.
Hab. South America.

Sp. 18. *P. Æneas*..... ♂, Lin. Syst. Nat. p. 747, 16.
— Roesel, Ins. ix. t. 2, f. 2.
— Lucas, Rev. and Mag. Zool. 1852, p. 191 (as *Bochus* of Bdv.)
♀, Hübn. Samml. Ex. (as *Marcius*).
Hab. Guiana and Pará.

Sp. ? 19. *P. Bolivar* ..... ♂, Hewits. Tr. Ent. Soc. 1851, p. 97, pl. 10, f. 2.
♀, Gray, Cat. B. M. pl. 10, f. 7.
Hab. Upper Amazons.

Sp. 20. *P. Orellana* ..... ♂, Hewits. Tr. Ent. Soc. 1852, p. 24, pl. 5, f. 2.
Hab. Upper Amazons.

Sp. 21. *P. Triopas* ..... Godt. Enc. ix. p. 33, No. 23.
Hab. Guiana, Pará and Lower Amazons.

Sp. ? 22. *P. Chabrias* ..... ♀, Hewits. Tr. Ent. Soc. 1852, p. 24, pl. 5, f. 2.
Hab. Upper Amazons.

The following are ♀ insufficiently known, but belonging to this section:—

P. Tarquinius, ♀, Bdv. Sp. Gen. Pap. 127.

The description of Boisduval is not sufficiently precise to enable us to indicate the position of this insect. In his collection the specimen is now mated with a Mexican ♂, allied to *Erithalion*.
Hab. Columbia.

P. Arcas, ♀, Cram. 378 C.

If the fringe in the figure were red instead of white, it would represent exactly the ♀ of *Eurimedes*.
Hab. Brazil (?).

P. Lycomes, ♀, Gray, List. p. 66; *Tullus*, ♀, Esper. Ausl. Schm. t. 12, f. 3.

I have not been able to consult the figure of Esper.
Hab. Surinam.

P. Anchises, ♀, Linn. Clerck, Icon. t. 29, f. 1.

The figure of Clerck represents a ♀ of some species allied to *Vertumnus*.
Hab. Surinam.

Section 2. Fringe of the wings rose-coloured.

Sp. 23. *P. Aglaope*..... ♂, Gray, Cat. B. M. p. 55, pl. 10, f. 5.
Hab. Pará.

Sp. 24. *P. Euristeus*..... ♂, Cram. 29 F.
Hab. Dutch Guiana.

Sp. 25. *P. Panthonus* ..... ♂, Cram. 278 C. D.
♀, Bates, Tr. Ent. Soc. vol. v. n. s. p. 343.
Hab. Dutch and English Guiana.

Sp. 26. *P. Lysander*..... ♂, Cram. 29 C. D.
— *Eurymas*, Godt. and Bdv.
— Gray, Cat. B. M. (as *Brissonius*, Hübn. ♂).
♀, Cram. 386 C. D. (as *Arbates*).
— Bdv. Sp. Gen. Pap. No. 118, part (as *Panthonus*, ♀).
— Godt. Ency. ix. Pap. No. 31 (as *Anchises*, L. part).
— Hübn. Samml. (as *Arbates*).
— ib. (as *Pompeius*).
— Hübn. Verzeich. (as *Brissonius*).
— Gray, Cat. pl. 8, f. 8 (as ♀ of *Brissonius*, Hübn.)

Hab. Guiana, and Upper and Lower Amazons.

Local var. (5) *Parsodes*.. ♂, Gray, Cat. p. 54, pl. 8, f. 3 (as *Parsodes* ♂).
♀, Gray, Cat. pl. 8, f. 4 (as (*Parsodes* ♀).
— Gray, Cat. p. 57 (as *Sonoria*), pl. 10, f. 1 (as *Sonoria*, var.)

Hab. Pará.

Sp. 27. *P. Echelus*..... ♂, Hübn. Samml.
♀, ib. (as *Echemon*).
? var. ♀, Gray, Cat. p. 55, pl. 10*, f. 1 (as *Spartacus*, Dbld.)

Hab. Pará.

Local var. (6) *Echephron*.. ♂, Bates, Tr. Ent. Soc. vol. v. N. S. p. 345, note.

Hab. Cayenne.

Sp. ? 28. *P. Ergeteles* ..... ♂, Gray, Cat. p. 52, pl. 8, f. 5.
♀, ib. p. 52.
♀, Bates, Tr. Ent. Soc. vol. v. p. 344.

Since my description of the ♀ was printed, I have found that Mr. Gray has already given an excellent description of it in the place quoted.

Hab. Lower Amazons.

Sp.? 29. *P. Æneides* ..... ♂, Esper. Ausl. Schm. t. 15, f. 3, ♂.
— Cram. 279 A. B. (as *Æneas*, L. ♂).
♀, Gray, Cat. p. 51, pl. 9, f. 8.
var. ♀, Hübn. Zutr. f. 997, 8 (as *Neophilus*).
Hab. Guiana, Lower Amazons and Pará.
Local var. (7) *Olivencius*.. ♂ and ♀, Bates, Tr. Ent. Soc. vol. v. N. S. p. 345.
Hab. Upper Amazons and New Granada.
Local var. (8) *Eurybates*.. ♂, Gray, Cat. p. 51, pl. 9, f. 1.
Hab. Bolivia.

Sp.? 30. *P. Eurimedes* ..... ♂, Cram. 386 E. F.
♀, Bdv. Sp. Gen. Pap. No. 123 (as *Arriphus*).
Hab. English Guiana, Venezuela and New Granada.
Local var. (9) *Agathocles*.. ♂, Kollar, Beitr. N. Gran. p. 2.
Hab. Orinoco.
Local var. (10) *Timias*. ♂, Gray, Cat. p. 50, pl. 9, f. 5.
Hab. Guayaquil.
Local var. (11) *Mylotes* (Gray) ♂ and ♀, Bates, Tr. Ent. Soc. vol. v. N. S. p. 346, note.
? ♀, *Docimus*, Gray, MSS. List, p. 64.
Hab. Nicaragua and Mexico.

Sp.? 31. *P. Zacynthus* ..... ♂, Fab. Ent. Syst. iii. 1, p. 15, 46.
♀, Fab. Ent. Syst. iii. 1, p. 16, 47 (as *Dimas*).
var. ♀, Gray, Cat. p. 56, pl. 10*, f. 2. (as *Eupales*).
Hab. S. E. Brazil.
Local? var. (12) ♂ *Polymetus*. .Godt. Encyc. ix. p. 35, 28.
Hab. S.E. Brazil.
Local var. (13) *Orsillus*.. ♂ and ♀, Swains. Zool. Illustr. 1st Ser. pl. 92 (as *Polymetus*, Godt.)
Gray, Cat. p. 57 (as *Orsillus*).
Hab Pernambuco and River Tapajos.

The following are ♀ of this section, which at present cannot be mated:—

P. Numa, ♀, Bdv. Sp. Gen. Pap. No. 116.

This species is represented by a solitary specimen in Dr. Boisduval's Collection. It resembles the ♀ of *Lysander*, but the fore-wings are much more rounded in outline, and the macular belt of the hind wing is composed of much more widely separated spots, which are of an oval or rounded lozenge-shape.

Precise habitat unknown.

P. Callicles, nob. ♀, Gray, Cat. B. M. p. 49, pl. 8, f. 10 (as ♀ *Enlaces*).

This is the ♀ of some species allied to *Lysander*. It comes from Bolivia, whence no ♂ allied to *Lysander* has as yet been received, to my knowledge.

XXV. *On the Atlantic* Cossonides. By T. Vernon Wollaston, Esq., M.A., F.L.S., &c.

[Read Feb. 4th, 1861.]

I propose, in this paper, to lay before the Entomological Society an enumeration of all the members of the Rhynchophorous subfamily *Cossonides* which have hitherto been detected in the Atlantic islands; and it will be perceived, by a glance at the following pages, that no less than forty of them have, up to the present date, been discovered in those various oceanic groups. But, as neither the Azorean archipelago nor that of the Cape de Verdes have as yet been investigated, it is certain that many additions will eventually be brought to light. In St. Helena, too, it is far from unlikely that others will be found—particularly of the anomalous genus *Microxylobius*, of which six exponents are recorded below. From the Madeiras, which have been now so carefully explored, and in which as many as nineteen of these Xylophagous Curculios have already been observed, we cannot expect much further material; whilst the fifteen Canarians may be safely regarded as a near approximation to the entire number inhabiting the neighbouring archipelago. The single species from Ascension, as will be gathered from the remarks, is perhaps a mere accidental importation into that island; though its close affinity with the *Mesoxeni*, and the fact of its being absolutely congeneric with the British *Pentarthrum*, would render it at all events probable that the insect is essentially an Atlantic one.

Touching the Madeiran and Canarian groups, of which alone I feel enabled to speak with any amount of precision, no one who has laboured in them practically can have failed to be struck with the important part which the *Cossonides* play in the several districts and altitudes of those mountain-islands. Whether in the few sylvan regions which still remain (and where a large proportion of them do the work of destruction amongst the magnificent Laurels which so eminently characterize the Atlantic flora), or whether on the exposed rocky slopes (where the gigantic Euphorbias nourish a fauna of their own, and the stalks of shrubby plants afford unfailing sustenance for these Rhynchophorous borers), or even beneath stones on the open serras of a lofty elevation, we find them strangely predominant, and occasionally in such profusion (though individually rather than specifically) that the various rotten stems appear to be almost alive with them.

As a slight aid to the eye, in judging of their *habitats*, I have thought it worth while to give the following geographical tabulation of these *Cossonides*, which will show at a glance to what island-groups they respectively belong; and it is curious to remark, that the species are so topographically restricted that apparently *only one out of the whole forty* (namely, the *Mesoxenus Monizianus*), has its range extended beyond a single cluster; whilst two extensive *genera* (not to mention smaller ones)—namely, *Caulotrupis* and *Microxylobius*, are, in like manner, thus limited geographically.

	Madeiras.	Canaries.	Ascension.	St. Helena.
Eremotes crassicornis, Br.		*		
Hexarthrum capitulum, W.	*			
Rhyncolus crassirostris, W.		*		
Caulophilus sculpturatus, W.	*			
Phlœophagus sulcipennis, W.	*			
——— tenax, W.	*			
——— calvus, W.	*			
——— caulium, W.		*		
——— laurinens, W.		*		
——— affinis, W.		*		
——— simplicipes, W.		*		
——— piceus, W.		*		
Caulotrupis lacertosus, W.	*			
——— subnitidus, W.	*			
——— lucifugus, W.	*			
——— impius, W.	*			
——— terebrans, W.	*			
——— Chevrolatii, W.	*			
——— opacus, W.	*			
——— conicollis, W.	*			
Microxylobius Westwoodii, Chev.				*
——— lacertosus, W.				*
——— lucifugus, W.				*
——— terebrans, W.				*
——— Chevrolatii, W.				*
——— conicollis, W.				*
Pentatemnus arenarius, W.		*		
Onycholips bifurcatus, W.		*		
Leipommata calcaratum, W.	*			
Mesoxenus Monizianus, W.	*			
——— Bewickianus, W.	*			
Pentarthrum cylindricum, W.			*	
Stenotis acicula, W.	*			
Mesites complanatus, W.		*		
——— persimilis, W.		*		
——— maderensis, W.	*			
——— Euphorbiæ, W.	*			
——— proximus, W.		*		
——— fusiformis, W.		*		
——— pubipennis, W.		*		

Genus Eremotes, nov. gen. (Pl. 18, fig. 1.)

Corpus sat parvum, cylindricum, calvum, profunde sculpturatum, *Hylurgi* formam simulans : *capite* convexo ; *rostro* brevi, crasso, lato, antice sensim attenuato ; *scrobe* valde profundâ obliquâ curvatâ, infra oculum (et ibidem subargute terminatâ) desinente ; *mandibulis* magnis, exsertis ; *oculis* longe ante marginem prothoracis anticum sitis, rotundatis, valde prominentibus : *prothorace* subconico, antice truncato (haud producto), pone marginem anticum transversim constricto : *scutello* rotundato, distincto : *elytris* cylindricis. *Antennæ* (18, 1a) breves, crassissimæ, ante medium rostri insertæ ; *scapo* brevi, robusto, gradatim clavato, vix curvato ; *funiculo* 7-articulato, articulo 1mo sat magno subquadrato, 2do brevissimo (præcedenti fere immerso), reliquis quinque brevibus transversis latitudine vix crescentibus, inter se sat arcte compressis et ultimo clavæ sat arcte adpresso ; *capitulo* parvo, haud abrupto, ovato basi truncato et apice leviter acuminato, solido, apicem versus obscure 3-annulato. *Pedes* robusti, crassi, *antici* ad basin fere approximati, *intermedii* distantiores, *postici* valde distantes : *femoribus* muticis : *tibiis* subcurvatis, ad apicem externum in uncum magnum acutum inflexum, necnon ad internum in spinam parvam productis : *tarsis* pseudotetrameris, articulo 3tio præcedentibus vix latiore.

Obs.—Genus inter *Cossonides* valde anomalum, *Hylurgi* formam simulans, sed tibiarum structurâ *Curculionidis* omnino congruit : rostro antennisque brevibus valde incrassatis, funiculi articulo secundo brevissimo (præcedente fere recondito), capitulo parvo minus abrupto, oculis valde rotundatis prominentibus longe ante marginem prothoracis anticum sitis, tibiarum angulo interno in spinam producto tarsorumque articulo antepenultimo præcedentibus vix latiore a generibus hujus Subfamiliæ plerisque discedit.

Ab *ἐρημωτὴς*, destructor [*ἐρημόω*, destruo].

Although his short notice of it omits to call attention to any single structural peculiarity of the insect except the thickness of its funiculus, I have but little doubt that the remarkable beetle from which the above generic characters have been compiled is identical with M. Brullé's *Hylurgus crassicornis*,—of Webb and Berthelot's "Histoire Naturelle des Iles Canaries." With *Hylurgus*, however, it has in reality nothing whatever to do, except in outward contour,—the formation of its apically uncinate, undi-

lated and externally-simple tibiæ being sufficient of itself to remove it from the whole of those sub-Rhyncophorous groups; whilst in its enormously thickened antennæ, small capitulum, and the excessively shortened second-joint of its funiculus (which is nearly lost within the enlarged basal one), as well as in its very prominent and perfectly rounded eyes (which are remote from the anterior edge of the prothorax), and the small spine with which the *inner* apex of its tibiæ is armed, it presents a combination of features essentially its own. Nevertheless, with the exception, perhaps, of the *Stenoscelis hylastoides*,* from the Cape of Good Hope, it probably makes a nearer approach to the various members of the *Hylesinidæ* than any other truly Curculionideous genus hitherto described; and may correctly, therefore, in conjunction with *Stenoscelis*, be placed at the very commencement of the *Cossonides*.

1. *Eremotes crassicornis*, Brullé. (Pl. 18, fig. 1.)

E. ater, subnitidus; rostro parce punctulato, fronte convexâ et foveolâ minutâ (plus minus canaliculiformi) impresso; prothorace profunde punctato (punctis magnis et versus latera confertissimis), ad latera paulo rotundato; elytris profunde punctato-striatis, interstitiis convexis et minute seriatim punctulatis, mox ante apicem utrinque plicato-subconstrictis; antennis pedibusque nigro-piceis, illarum capitulo ferrugineo.

Long. corp. lin. 2—vix $2\frac{1}{2}$.

Habitat sub cortice laxo necnon in truncis putridis *Pini canariensis* in locis elevatis insularum Canaria, Teneriffa et Palma, hinc inde rarior.

Hylurgus crassicornis? Brullé, Webb & Berth. Hist. Nat. des Iles Can. 71 (1839).

This singular insect appears to subsist exclusively under the loose bark and in the rotten wood of the *Pinus canariensis*, in the old (and often inaccessible) Pinals of the Canary Islands. It probably occurs wherever the Pinals still remain; though, from the excessive difficulty of exploring the remote serras and mountain-slopes on which they are principally situated, I have myself, up to the present time, only observed it above San Bartolomao (in the district of Tarajana), of Grand Canary, at the Agua Mansa of Teneriffe, and in the Barranco above Santa Cruz of Palma. It will doubtless be found, equally, in Gomera and Hierro; though

* Vide "Journal of Entomology," i. pl. XI., fig. 1 (1861).

in Fuerteventura and Lanzarote, where not so much as a fir-tree exists, of course it cannot be expected to occur.

Genus Hexarthrum. (Pl. 18, fig. 2.)

Woll., Annals of Nat. Hist. (Ser. 3), v. 448 (1860).

The weevil for which I established the present genus in the "Annals of Natural History" for June, 1860, was described by myself in the December number of 1858 as the *Rhyncolus capitulum;* and it was through not having my original type of the latter to compare with it that I inadvertently characterized it afresh, giving it the name of "*Hexarthrum compressum*." Since, therefore, I overlooked the structural peculiarity of the genus in my first Paper and re-described the species in my second, it follows that the title under which the insect must stand is *Hexarthrum capitulum*, the specific name of *compressum* having been superseded by the other.

In its 6-jointed funiculus (18, 2a), *Hexarthrum* differs from all the other genera of the *Cossonides* here enumerated, with the exception of the anomalous *Onycholips*, which may possibly be regarded as a somewhat doubtful member of the present sub-family; whilst in its excessively short, broad, triangular rostrum, depressed eyes, and its thick, abbreviated antennæ, it is still further characterized. In everything, however, but the number of the joints of its funiculus it is identical with the true *Rhyncoli*,—its funiculus-articulations being closely compacted together, and with the second of them not longer than the third; whilst in the almost unexpanded antepenultimate joint of its feet it is equally on the *Rhyncolus*-type; nevertheless, the character above alluded to will at once distinguish it from that group.

2. *Hexarthrum capitulum*, Woll. (Pl. 18, fig 2.)

Rhyncolus capitulum, Woll., An. of Nat. Hist. (Ser. 3), ii. 410 (1858).
Hexarthrum compressum, Id., An. of Nat. Hist. (Ser. 3), v. 449 (1860).

Habitat Maderam australem, in ligno antiquo a D.D. Park et Bewicke repertum.

Apparently very rare, or at any rate extremely local, and observed hitherto only in the south of Madeira, where a single specimen of it (described by myself as the "*Rhyncolus capitulum*") was first detected by Mr. M. Park. Several examples, however, have been found more recently by Mr. Bewicke amongst old wood, in company with the *Mesoxenus Bewickianus*, in a small shed, or outhouse, at the Praia Formosa, near Funchal.

Genus Rhyncolus. (Pl. 18, fig. 3.)

(Creutz), Germar, Ins. Spec. 307 (1824).

The *Rhyncoli* and *Phlœophagi* are very closely related *inter se;* and of the three Madeiran exponents I have hitherto regarded only one (the *P. sulcipennis*) as belonging to the latter, assigning the other two (*R. tenax* and *calvus*) to the former. The detection, however, of a typical *Rhyncolus* in the Canary Islands has induced me to believe that the whole three of these Madeiran representatives are better referred to *Phlœophagus*, with the recorded characters of which they have certainly more in common. Thus, whilst the rostra of the true *Rhyncoli* are more or less abbreviated and thick, and the antennæ (18, 3 a) short, with their funiculus-joints closely compressed together (the second one, moreover, being as short as, or even shorter than, the third), and with their capitulum usually small; in the *Phlœophagi* the rostra and antennæ are for the most part longer and slenderer, the club of the latter is more abrupt, and the joints of the funiculus are more separated or distinct, the second one of which is obconical, and decidedly longer than the third. The *Phlœophagi*, also, have their prothorax generally more rounded at the sides than is the case with the *Rhyncoli*, and the humeral angles of their elytra rather more sloped off or obliquely-truncated; but in this latter particular (which is not a very important one) the two Madeiran insects which I had regarded as *Rhyncoli* partake more of the *Rhyncolus*- than of the *Phlœophagus*-type.

3. *Rhyncolus crassirostris*, n. sp. (Pl. 18, fig. 3.)

R. piceus, subnitidus; rostro brevi, lato, triangulari, sat crebre punctulato, oculis oblongis, valde demissis; prothorace profunde punctato (punctis magnis et versus latera confertis), ad latera minus rotundato; scutello transverso; elytris profunde punctato-striatis, interstitiis sub-convexis et minute sub-seriatim punctulatis; antennis brevissimis pedibusque rufo-piceis, illarum capitulo rufo-ferrugineo, solidissimo, ad apicem valde truncato.

Long. corp. lin. $1\frac{1}{2}$.

Habitat in truncis emortuis *Pini canariensis*, una cum genere præcedenti degens; in regione "Tarajana" ins. Canariæ mense Aprili A.D. 1858 primus inveni.

The present *Rhyncolus* has much the general appearance of the European *R. truncorum;* nevertheless its rostrum is broader and shorter (being very thick and triangular); its antennæ (18, 3a) are

still more abbreviated, with their club abrupter and more straightly truncated at its apex; its prothorax is much more deeply and remotely sculptured, and its elytral punctures are also larger, the small intermediate ones especially being more perceptible. In its closely-compressed funiculus-joints (the second of which is quite as short as the following one), and the unexpanded third joint of its feet, it agrees with the *R. truncorum;* nevertheless its funiculus (no less than the scape) is altogether shorter than is the case in that insect, and the joints themselves are more transverse. It appears to be confined to the Pinals of the Canarian group, where it perforates the old fir-trees, in company with the *Eremotes crassicornis*. I took several examples of it out of the rotten trunk of a *Pinus Canariensis* on the ascent to the Cumbre above San Bartolomao, in the district of Tarajana, of Grand Canary, during my sojourn there with the Rev. R. T. Lowe, in April, 1858, but I have not hitherto observed it in any of the other islands.

Genus Caulophilus.

Woll., Ins. Mad. 315, tab. vi. f. 4 (1854).

I have no further remark to offer on this genus than those recorded in the "Insecta Maderensia;" the small weevil on which it was founded in 1854, and which was captured in 1847, being, after our combined (but intermittent) researches for now fourteen years, still unique. Whether a more critical examination of it would tend to unite it with either the *Phlœophagi* or *Rhyncoli*, I will not (in the absence of the original type, which is no longer in my possession) speculate, though I may just repeat the observation, that "its linear outline, and depressed, deeply sculptured surface, in conjunction with its comparatively large eyes and scutellum, will at once serve to separate it" from, at any rate, *Caulotrupis;* and I may further add, that if it has eventually to be united with either of the above-mentioned genera, the chances are that it will be more easily associated with *Rhyncolus* than with *Phlœophagus*.

4. *Caulophilus sculpturatus.*

Caulophilus sculpturatus, Woll., Ins. Mad. 315, tab. vi. f. 4 (1854).
Id., Cat. Mad. Col. 104 (1857).

Habitat Maderam australem, sero autumno A.D. 1847 specimen unicum prope Funchal deprehensi.

The single example as yet detected was captured by myself, during the autumn of 1847, from beneath a stone, on an exposed

grassy slope to the eastward of Funchal, just before arriving at the Cabo Garajâo, or Brazen Head.

Genus Phlœophagus. (Pl. 18, fig. 4.)

Schönherr, Gen. et Spec. Curc. iv. 1017 (1838).

As already stated, I propose removing the two Madeiran insects hitherto regarded as *Rhyncoli* into the genus *Phlœophagus*, their elongated antennæ and rostra (as compared with the *Rhyncoli* proper), laterally-rounded prothorax, somewhat larger club and *less compact* funiculus-joints (the second one of which, moreover, is distinctly longer, *vide* 18, 4a, than the third), agreeing better with the published diagnosis of the latter than with that of the former. So that we shall have, up to the present date of discoveries, only a single *Rhyncolus* in the Atlantic islands, namely, the *R. crassirostris*, from the Canaries; whilst of the *Phlœophagi* there will be three in the Madeiran- and five in the Canarian-groups. These "five" latter ones constitute a small geographical assemblage, and are very closely related *inter se*, being at first sight scarcely separable from each other. Nevertheless their characters are in reality extremely constant, and are not the less real because they happen to be (for the most part) *microscopic*, and thus far, therefore, difficult of observation. At least I can affirm with truth that, in compiling their diagnoses, I have examined most critically upwards of 300 specimens, and that I have not found a single individual which has left me in the slighest doubt as to the precise type to which it belonged; though it is certainly an open question whether one or two which I have thought it safer to record as *varieties* may or may not hereafter, when further material is amassed, be considered to rank as additional species.

5. *Phlœophagus sulcipennis*, Woll.

Phlœophagus sulcipennis, Woll., Ins. Mad. 308 (1854).
Id., Cat. Mad. Col. 100 (1857).

Habitat Maderam, in ligno putrido, locis inferioribus, passim: in horto suo, etiam in ipsâ urbe Funchalensi, plurima specimina collegit Dom. Moniz.

The *P. sulcipennis* has occurred hitherto only in Madeira proper, where, until numerous examples were found two years ago by Sr. Moniz in his garden at Funchal, I had considered it extremely rare—the only specimens in fact which I had seen being two which were collected by the late Dr. Heineken. But, since

Sr. Moniz's extensive and successful capture, it has been likewise taken, though much more sparingly, by Mr. Bewicke. It is very closely allied to the European *P. spadix*, of which it may possibly be only a geographical state; but its elytra are just perceptibly more ovate and less rugulose, with their striæ less deeply impressed, and their punctures (when viewed beneath the microscope) rather smaller and considerably more remote; its pubescence, too, is perhaps a little shorter, and its antennal club somewhat less robust.

6. *Phlœophagus tenax*, Woll. (Pl. 18, fig. 4.)

Rhyncolus tenax, Woll., Ins. Mad. 307 (1854).
Id., Cat. Mad. Col. 100 (1857).

Habitat Maderam sylvaticam, sub cortice arborum laxo (præsertim laurorum) in locis elevatioribus vulgaris.

An abundant insect throughout all the sylvan districts of Madeira, occurring principally in the laurel-woods of intermediate and lofty elevations.

7. *Phlœophagus calvus*, Woll.

Rhyncolus calvus, Woll., Ann. of Nat. Hist. (Ser. 3), v. 448 (1860).

Habitat Maderam australem, in ligno antiquo haud procul ab urbe Funchalensi à Dom. Bewicke repertus.

Found only, hitherto, in Madeira, and only by Mr. Bewicke, by whom it was detected amongst rotten wood, in company with *Hexarthrum capitulum* and the *Mesoxenus Bewickianus*, during May of 1857, in a small shed (or out-house) at the Praia Formosa, near Funchal. In general contour and type it approaches the five Canarian species described below; and in its rather narrow outline, piceous hue, and but slightly dilated antepenultimate tarsal-joint, it is, perhaps, nearer to the *P. piceus* than to any of them. It is, however, still more piceous than that insect; whilst its elytra are much less deeply punctate-striated than is the case with any of the Canarian *Phlœophagi*—the punctures of the striæ being not only less impressed, but smaller and more remote; its scutellum is *very* minute and triangular, but quite apparent beneath the microscope.

8. *Phlœophagus caulium*, n. sp.

P. nigro-piceus; prothorace valde profunde punctato; scutello vix observando [oculo valde armato, minutissimo transverso]; elytris oblongo-ovatis, profunde punctato-striatis, interstitiis

vix convexis; pedibus piceis, tibiis subcurvatis, tarsorum articulo tertio distincte dilatato-bilobo; antennis piceo-ferrugineis, capitulo ovali.

α. prothorace valde profunde punctato, elytris sat profunde punctato-striatis, interstitiis depressiusculis. [*Insula* Lanzarote.]

β. prothorace vix densius leviusque punctato, elytris paulo profundius punctato-striatis, interstitiis paulo magis convexis. [*Insula* Fuerteventura.]

Long. corp. lin. $1\frac{1}{2}$—vix 2.

Habitat insulas Lanzarote et Fuerteventura Canarienses, in ramis Euphorbiarum emortuis vulgatissimus.

The present *Phlœophagus* has a just perceptibly different phasis for the islands of Lanzarote and Fuerteventura respectively (the specimens from the former having their elytra a trifle less densely sculptured and with the interstices more depressed, and their prothoracic punctures perhaps somewhat larger and more remote); nevertheless they agree in everything essential, and more especially in their obsolete scutellum—it being barely possible to catch a glimpse of it even beneath the highest power of the microscope (where, however, it may occasionally be just detected in the form of a minute *transverse* plate). The *P. caulium*, moreover, has its tibiæ less straightened than in the following species (though they can scarcely be called flexuose); the third joint of its tarsi is very distinctly expanded and bilobed, and its limbs are a trifle shorter and darker than is the case in the *P. laurineus*. It occurs in Lanzarote and Fuerteventura (the two eastern islands of the Canarian Archipelago), where it would seem to be peculiar to the decayed *Euphorbia*-stems, and where it was taken abundantly by Mr. Gray and myself in January, 1858, and subsequently by myself in March, 1859. It may often be seen crawling up the whitewashed walls in the villages and towns; but, as the greater part of the fuel used for burning is composed of dried bushes of the various Euphorbias, which may frequently be observed piled in heaps near the houses, I have but little doubt that such specimens are accidental ones, transported from their proper *habitats*. In compiling the above diagnosis I have inspected closely seventy-three examples.

9. *Phlœophagus laurineus*, n. sp.

P. nigro-piceus; prothorace valde profunde punctato; scutello distincto, triangulari; elytris sub-oblongis, valde profunde

punctato-striatis (punctis magnis), interstitiis valde convexis; pedibus rufo-piceis, tibiis rectis, tarsorum articulo tertio distincte dilatato-bilobo; antennis pallido-ferrugineis, elongatis, sub-gracilibus, capitulo sub-acuto-ovali.

Var. β. *capitulatus* [an species distincta?], paulo minus profunde sculpturatus, prothorace sub-alutaceo punctis vix minoribus densioribus, elytrorum interstitiis vix minus costatis, capitulo vix abruptiore breviore. [*Insula* Palma.]

Long. corp. lin. $1\frac{1}{2}$—vix 2.

Habitat in locis editioribus Teneriffæ, sub cortice laxo necnon in truncis emortuis lauvorum, hinc inde vulgatissimus: *var.* β. ad insulam Palmam sola pertinet.

Whilst the preceding *Phlœophagus* appears to be peculiar to the *Euphorbia*-stems of Fuerteventura and Lanzarote, the present one, so far as I have hitherto observed, is attached to the Laurels of Teneriffe and Palma, in the decayed trunks of which it often abounds, at intermediate and lofty elevations. At first sight the whole of these Canarian species are scarcely recognizable from each other; but, when placed beneath the microscope, the present and two following ones will be found to have very distinct scutella—which would suffice, even of itself, to separate them from the *P. caulium* and *piceus*. Amongst other characters, however, I may mention that the *P. laurinus* has its elytra (which are perhaps a trifle less ovate) more deeply sculptured than those of any of its allies, the punctures of which (except as compared with those of the *P. simplicipes*) are perceptibly larger and the interstices more convex; its antennæ, also, are slightly elongate and pale, with their funiculus-joints somewhat lax *inter se*, and their club rather acute, and its third tarsal-articulation is almost (if not quite) as much expanded and bilobed as in the last species.

The *var.* β (which would seem to be peculiar to Palma) may possibly be distinct, in reality, from the typical form of Teneriffe; nevertheless, its differential characters are so small that I have thought it better not to isolate it; it differs in having its prothorax (when viewed beneath the microscope) sub-alutaceous, with the punctures rather smaller and more dense, in its elytral interstices being somewhat less convex, and its antennal-club a trifle more abbreviated and abrupt,—in most of which respects (though not in all) it is somewhat intermediate between the *typical laurinus* and the *affinis:* nevertheless, in the paleness of its antennæ and its principal characters (and I believe, also, in its habits), it has, I think, more in common with the former than with

the latter. I have taken the *P. laurineus* abundantly beneath the bark and in the rotten wood of old laurels in most of the few remaining sylvan districts of Teneriffe, such as the Agua Garcia, Las Mercedes, Taganana, &c.; and the *var.* β I found (so far as I can recollect) under similar circumstances in the Barranco da Agua, on the north-west of the island of Palma. Of the typical form I have examined carefully no less than 161 specimens; and of the *var.* β. eighteen.

10. *Phlœophagus affinis*, n. sp.

P. nigro-piceus; prothorace sub-alutaceo, sat profunde punctato; scutello distincto, triangulari; elytris oblongo-ovatis, sat profunde punctato-striatis, interstitiis plus minus depressiusculis, pedibus rufo-piceis, tibiis rectis, tarsorum articulo tertio sat distincte dilatato-bilobo; antennis ferrugineis, capitulo sub-acuto-ovali.

Var. β *proximus* [an species distincta?], prothorace vix vel haud subalutaceo, elytrorum interstitiis sub-convexis, capitulo elongato. [*Insula* Hierro.]

Long. corp. lin. $1\frac{1}{3}$—$1\frac{2}{3}$.

Habitat Teneriffam, nisi fallor in ramis Euphorbiarum, hinc inde vulgaris: *var.* β in insulâ Hierro adhuc sola observavi.

For the present *Phlœophagus* I have no very decided structural character, and I can therefore best express it *negatively*,—i. e., by stating what it is *not*. Thus, its exceedingly perceptible scutellum (when viewed beneath the microscope) at once removes it from the *P. caulium* and *piceus*, whilst its sufficiently expanded third tarsal-joint will likewise prevent its confusion with the latter, and therefore *à fortiori* with the *simplicipes*. It remains, therefore, only to point out its distinctions from the *laurineus*, and this, *in its normal state*, is easily done, since it is not only less deeply sculptured, and with its antennæ somewhat darker and not quite so elongate, but its elytral interstices are less convex, and its prothorax (like the *var.* β of the *laurineus*) is more or less sub-alutaceous and with its punctures a little smaller and more dense. In the *var.* β (from Hierro) all these points are a trifle less evident, and it is possible, therefore, that further material from that island might prove the "*var.* β" to be distinct, since it stands in much the same relation to the typical specimens as the Palman "*var.* β" of the last species does to *its* supposed type. In the Hierro examples the prothorax does not appear sub-alutaceous under the microscope, and its elytral interstices are not quite so depressed

as in those from Teneriffe; nevertheless, my own belief is that they are a mere phasis of the latter. The *P. affinis* is, I *believe*, attached principally to the *Euphorbia*-stems of low and intermediate elevations, rather than to the forest trees of the higher ones; at all events I have taken the normal state in such positions at Taganana, in the north of Teneriffe, and also more sparingly at the Agua Mansa; the *var.* β was found at a very slight altitude above the sea in the region of El Golfo, on the west of Hierro. Of the former I have examined carefully, beneath the microscope, twenty-two specimens; but of the latter only nine.

11. *Phlœophagus simplicipes*, n. sp.

P. nigro-piceus; prothorace valde profunde punctato; scutello distincto, triangulari; elytris oblongo-ovatis, profunde punctato-striatis (punctis magnis), interstitiis convexis; pedibus rufo-piceis, tibiis sub-rectis, tarsorum articulo tertio vix dilatato; antennis ferrugineis, crassiusculis, scapo breviusculo, capitulo ovali.

Long. corp. lin. $1\frac{1}{3}$—vix $1\frac{2}{3}$.

Habitat Teneriffam, arbores emortuas fici in locis inferioribus terebrans.

The *P. simplicipes* is very closely allied to the *laurineus*, but is rather smaller, with its elytra just perceptibly more ovate (or expanded behind the middle), with the interstices not quite so convex, and with its antennæ a little thicker, darker and shorter (the scape particularly being more abbreviated, and the sub-clavel joints somewhat broader). A more conspicuous character, however, exists in its third tarsal articulation, which is hardly at all dilated and bilobed. Unlike the *P. laurineus*, it appears to occur at low elevations, and to be attached (so far as I have hitherto observed) to decayed fig-trees, in the dry, rotten wood of which it frequently swarms. Under such circumstances I have taken it abundantly in the Barranco do Passo Alto, near Santa Cruz, of Teneriffe. The above diagnosis is drawn out from twenty examples.

12. *Phlœophagus piceus*, n. sp.

P. piceus, angustulus; prothorace sat profunde punctato; scutello vel vix vel haud observando; elytris oblongo-ovatis, ad humeros rectioribus (i.e. minus oblique truncatis), sat profunde punctato-striatis, interstitiis paulo convexis; pedibus rufo-piceis, tibiis sub-rectis, tarsorum articulo tertio paulo

dilatato; antennis ferrugineis, funiculi articulis inter se subarctius adpressis, capitulo ovali, abrupto.

Var. β *subparallelus* [an species distincta?] paulo major, prothorace paulo minus profunde punctato, scutello vix distinctiore. (*Insulæ* Lanzarote et Fuerteventura.)

Long. corp. lin. $1\frac{1}{4}$—$1\frac{1}{2}$.

Habitat Canariam Grandem, in arbore quâdam fici emortuâ ad Mogan mense Aprili A.D. 1858 deprehensus.

The present *Phlœophagus* differs from all the other Canarian species hitherto observed in its somewhat smaller size, narrower outline and more piceous hue. In its only slightly-expanded antepenultimate tarsal-joint (which, however, is broader than in that species), as well as in its habits (for it appears to be attached to the fig-trees of comparatively low elevations), it approaches the *P. simplicipes;* nevertheless, apart from the characters just alluded to, its less deeply sculptured surface, somewhat more compact funiculus-joints, less obliquely-truncated shoulders and usually imperceptible scutellum, will immediately separate it from that insect. Indeed, out of ten examples from which the above (typical) diagnosis has been compiled, it is only in one of them that I can detect the least trace of a scutellum, even beneath the highest power of the microscope (though a small triangular *place for its reception* is just visible); whereas in the last species the scutellum is, in all instances, remarkably conspicuous.

The *var.* β (from Lanzarote and Fuerteventura), which may possibly be specifically distinct, is, on the average, a trifle larger than the Grand Canarian type, with its scutellum rather more perceptible, and its prothorax a little less deeply punctured. The ten specimens from Grand Canary were found in the rotten wood of an old fig-tree at Mogan, towards the south-west of the island, on the 16th of April, 1858. Of the *var.* β I have hitherto captured only four examples in Lanzarote and one in Fuerteventura; but two more of it were taken in the former island by Mr. Gray. I believe they all occurred in decayed fig-trees.

Genus Caulotrupis.

Woll., Ins. Mad. 308, tab. vi. f. 6, 7, 8, 9 (1854).

I am far from being convinced that this genus can properly be dissevered from *Phlœophagus;* and it was mainly through the species which compose it being somewhat remarkable externally, and appearing to constitute a small geographical assemblage peculiar to the Madeiras, that I thought it desirable originally to

establish it. Unfortunately the *instrumenta cibaria* of the *Curculionidæ* are so totally ignored and unknown, that we may probably often fail in recognizing the distinctness of closely allied groups for which good structural characters (however small) might be afforded by a careful dissection; and it is far from improbable, therefore, that the rather singular contour of these stalk-infesting *Caulotrupides* may be indicative of more decided modifications of their oral organs: at any rate, until this point is fairly settled, I prefer keeping them still apart from the *Phlœophagi*. Their main features consist in their comparatively unsculptured surfaces—their prothoraces especially (which have a tendency to become more or less conical) being nearly free from sculpture,—in their apterous, fusiform bodies, sub-connate elytra, and in their scutella being almost or entirely obsolete. Their third tarsal-joint also is somewhat more evidently expanded than is the case in the ordinary *Phlœophagi*; but how far any of these characters may be the index of more important ones yet to be discovered, I will not at present venture to conjecture.

13. *Caulotrupis lacertosus*, Woll.

Caulotrupis lacertosus, Woll., Ins. Mad. 309, t. vi. f. 6 (1854).
Id., Cat. Mad. Col. 102 (1857).

Habitat Maderam sylvaticam (præsertim borealem), sub cortice necnon in ligno emortuo laurorum, hinc inde sat vulgaris.

Not an uncommon insect towards the lower limits of the sylvan regions of Madeira, especially, however, in the north of the island,—occurring in the rotten wood, and under the bark, of forest-trees, particularly laurels.

14. *Caulotrupis subnitidus*, Woll.

Caulotrupis subnitidus, Woll., Ann. of Nat. Hist. (Ser. 3), v. 452 (1860).

Habitat insulas Maderenses (sc. Maderam et Desertam Grandem), ramos *Euphorbiæ piscatoriæ* in locis sub-inferioribus terebrans.

Apparently peculiar to the dead *Euphorbia*-stems of Madeira and the Deserta Grande, occurring usually in spots of a rather low elevation.

15. *Caulotrupis impius*, Woll.

Caulotrupis impius, Woll., Ins. Mad. 311 (1854).
Id., Cat. Mad. Col. 103 (1857).

Habitat insulas Maderenses (sc. Maderam, Desertam Grandem

et Desertam Australem), intra caules *Silybi Mariani*, Grtn. (= *Cardui benedicti*, antiquorum), degens.

Found on three of the Madeiran islands,—being very abundant on the Deserta Grande, apparently more scarce on the Southern Deserta, and rare in Madeira proper. So far as I have hitherto observed, it is confined to the soft, pithy stalks of the *Silybum Marianum* (the "Holy Thistle" of the ancients); though it may possibly occur in other plants likewise.

16. *Caulotrupis lucifugus*, Woll.

Caulotrupis lucifugus, Woll., Ins. Mad. 310, t. vi. f. 7, 9 (1854).
Id., Cat. Mad. Col. 102 (1857).

Habitat insulas omnes Maderenses, in insulo singulo plus minus varians,—vel intra caules plantarum vel sub lapidibus occurrens.

A universal insect throughout the Madeiran group, though nowhere (unless perhaps on the Northern Deserta) very abundant,—occurring at low and intermediate elevations, either under small stones or at the base of the stems of various plants, and having a more or less distinct phasis for the several islands.

17. *Caulotrupis terebrans*, Woll.

Caulotrupis terebrans, Woll., Ins. Mad. 312, t. vi. f. 8 (1854).
Id., Cat. Mad. Col. 103 (1857).

Habitat Portum Sanctum, in cacuminibus montium rarissimus.

An exceedingly rare species, two specimens only having hitherto been taken,—captured by myself on the summit of the Pico do Facho, in April, 1848.

18. *Caulotrupis Chevrolatii*, Woll.

Caulotrupis Chevrolatii, Woll., Ins. Mad. 313 (1854).
Id., Cat. Mad. Col. 103 (1857).

Habitat Maderam sylvaticam, in locis editioribus haud infrequens.

A generally distributed insect throughout the sylvan regions of Madeira proper, occurring principally at a high elevation.

19. *Caulotrupis opacus*, Woll.

Caulotrupis opacus, Woll., Ins. Mad. 313 (1854).
Id., Cat. Mad. Col. 103 (1857).

Habitat Maderam sylvaticam, in locis similibus ac præcedens sed illo paulo rarior.

Occurs in the sylvan districts of Madeira proper, though somewhat more rarely perhaps than the *C. Chevrolatii*.

20. *Caulotrupis conicollis*, Woll.

Caulotrupis conicollis, Woll., Ins. Mad. 314 (1854).
Id., Cat. Mad. Col. 103 (1857).

Habitat insulas Maderenses (sc. Maderam et Desertam Grandem), sub lapidibus vel ad caules plantarum, passim.

Found sparingly in Madeira and on the Deserta Grande, occurring under stones and at the stems of plants, at rather low and intermediate elevations.

Genus Microxylobius. (Pl. 18, figs. 5, 6, 7, 8, 9.)

Chevrolat, Trans. Ent. Soc. Lond. (1st Series), i. 98 (1836).

Corpus parvum, glabrum, in speciebus nonnullis fusiformi-elongatum, in aliis etiam breviter ovatum : *rostro* longiusculo, subarcuato, deflexo ; *scrobe* obliquâ, profundâ, subrectâ, infra oculos (laterales, sat magnos, rotundatos, demissos) desinente : *prothorace* ad latera plus minus rotundato, rare conico : *scutello* haud observando : *elytris* connatis : *alis* obsoletis : *abdomine* e segmentis 5 composito, articulis 1mo et 2do magnis (illo paulo majore), inter se arctissime connatis (suturâ ægre observandâ), 3tio, 4toque brevissimis æqualibus, ultimo majore subtriangulari. *Antennæ* (18, 5a, 6a, 7a, 8a, 9a), crassiusculæ, ultra medium rostri insertæ ; *scapo* subarcuato, apice clavato ; *funiculo* 5-articulato, articulo 1mo secundo aut vix aut (ut in typicis) distincte latiore, 2do 3tioque vel (ut in typicis) inter se subæqualibus vel illo longiore, 4to 5toque plus minus brevibus subæqualibus (hoc clavæ haud arcte adpresso) ; *capitulo* solido, plus minus elongato-ovato, obscurissime 4-annulato. *Pedes* (18, 6b, 7b, 8b, 9b), elongati, robustissimi, subæquales, *antici* ad basin fere approximati, *intermedii* paulo distantiores, *postici* valde distantes : *femoribus* vel (ut in typicis) muticis, vel *posticis* (in utroque sexu ?) spinâ magnâ acutissimâ sub-basali supra armatis ; *posticis* (præsertim in sexu masculo ?) versus apicem interne transversim strigulosis et per marginem inferiorem plus minus obscure irregulariter tuberculatis : *tibiis* subrectis, validis, ad apicem externum in uncum magnum elongatum inflexum acutum productis, ad internum angulo parvo spiniformi terminatis : *tarsis* pseudotetrameris, articulo 3tio plus minus late bilobo.

After a careful consideration of the five insects described below, all of which were taken at St. Helena, by my friend Mr. Bewicke, of Madeira, amongst native vegetation, on the extreme summit of the island, I have come to the conclusion, in spite of their great

variety of outline, and the anomalous character* possessed by two of them *of a large acute spine towards the base of the upper (!) edge of their femora*, that they are nevertheless members of a single group; and I am the more convinced of this, since in many well-known Rhynchophorous genera (such as *Centorhynchus*, *Cœliodes* and *Bruchus*), we have exponents with toothed thighs (though toothed in the usual manner, it is true,—i.e. on the *under* side, not on the upper), and others with simple ones. For when we take into account their most peculiar feature of a 5-jointed funiculus, as well as their glabrous bodies, obsolete scutella, and the other essential points of their structure, it is impossible to help perceiving that they are all nearly akin *inter se* and cannot properly be separated. I have, however, formed a distinct section for the dentate species, and have given it a provisional name, in the event of its being found desirable hereafter to detach it from the other.

Judging from his description and figure, and taking into account the island *habitat*, there cannot be the slightest doubt whatsoever, that at any rate the *first two* species described below are congeneric with M. Chevrolat's *Microxylobius Westwoodii*, characterised in the first volume of the "Tran. of the Ent. Soc. of London," in 1836. I have, however, compiled a fresh diagnosis for this interesting little group, because that given by M. Chevrolat, being founded upon the details of a solitary representative, does not apply to the whole five now before me; whilst, moreover, even as regards those points in which it is sufficiently accurate, it is far too short. It would seem, too, *inter alia*, that his *quasi*-generic character, "elytra *singulatim* rotundata extremitate," is merely a trivial one, as it certainly does not accord with any of the species here established (though it is a feature which is more or less evident in the *Pentarthra proper*, and one which is just traceable even in the two *Mesoxeni* from Madeira and the Canaries), whilst the specific variation in the length of the second joint of the funiculus he had of course no opportunity of ascertaining,—his *M. Westwoodii* belonging apparently to the former of my divisions, in which that articulation is scarcely longer than the third, and following ones. Moreover, his "Pedes

* Whether this character be a sexual one or not, I am scarcely able, from want of more material, to pronounce for certain; but my belief is, that it is *not* sexual. At any rate, I have certainly both sexes of the *M. lucifugus*; and therefore, as there is no appearance of femoral spines in either males or females of that species, it is at least probable that the structure is not dependent on the sex in the *M. Chevrolatii* and *conicollis*.

tot approximati," which would imply (if indeed anything decisive can be extracted from the expression), that all the legs are equally distant (and but very slightly so) at their base, can have no meaning at all in the present and neighbouring groups,—in which (like most of the *Cossonides*) the anterior pair are but very little separated from each other, the intermediate ones a good deal more so, and the hinder pair excessively distant.

Although members of the same sub-family, and possessing a 5-jointed funiculus, the *Microxylobii* are essentially distinct from the *Pentarthra*, and may be regarded as a little geographical assemblage, in all probability (like the *Caulotrupides*, in Madeira) peculiar to St. Helena. Apart from their very great differences of outward configuration, and the spiniferous femora of some of them, they may be known from the *true Pentarthra* (which are narrow, cylindrical, linear, deeply sculptured insects, like *Mesites* and *Cossonus*), by their obsolete scutellum, and more elongated limbs and rostrum,—the latter of which is, moreover, less straightened, and with the antennæ inserted much nearer to its apex; whilst the antennæ of the typical *Pentarthra* are (in both sexes) strictly *medial*, or (if anything, perhaps) implanted a trifle even *behind* the middle, rather than before it.

It would seem, indeed, that there is a small *cluster* of Cossonideous groups with 5-jointed funiculi; for, now that I have lately received, through the indefatigable researches of Mr. Bewicke, a second species of *Pentarthrum proper* from the island of Ascension, I have no hesitation whatsoever in regarding the two weevils from Madeira and the Canaries, which (through a disinclination to multiply genera) I had lately registered* as *aberrant Pentarthra*, as a separate genus (for which in the present paper I have proposed the name of *Mesoxenus*),—characterized by its almost obsolete eyes, and differing from *Pentarthrum proper* in the more convex, fusiform, *escutellate* bodies, less straightened rostra, and more apically inserted antennæ of the insects which compose it; and from the St. Helena *Microxylobius* (to which, perhaps, it is more akin), in the smaller size and unmetallic surfaces of its two hitherto detected representatives,—which, moreover, have a less dilated antepenultimate tarsal joint, their antennæ implanted a *little* further from the apex of their rostrum, and no tendency whatever for the above-mentioned anomalous femoral spines. So that, if my premises be correct, we shall

* *Vide* "Annals of Natural History" (1860), where these two insects are described, under the names of *Pentarthrum Monizianum* and *Bewickianum* respectively.

have (up to the present date of discoveries) *all with a 5-jointed funiculus*, the following eleven exponents of the sub-family *Cossonides*:—two *Pentarthra* (viz. from the west of England and the island of Ascension respectively); two *Mesoxeni* (from Madeira and the Canaries); one *Pentatemnus* (from the roots of sand-plants in the Canaries); and including M. Chevrolat's original type, which I have not inspected, six *Microxylobii* (from St. Helena).

The *Microxylobii* now before me, although possessing (as lately stated) the same essential characters amongst themselves, differ so very much (specifically) in external contour, that we may be almost certain that many intermediate forms will yet be brought to light, and that, like the Madeiran *Caulotrupides*, they will be found to be an extensive insular assemblage. So curious an analogy, indeed, do they bear to the several members of *Caulotrupis*, that I have given these five the same trivial names *inter se*, by way of calling attention still further to this singular (though, perhaps, somewhat fanciful) parallelism.

§ I. *Femora* (*in utroque sexu?*) *mutica.*

A. *Funiculi articulus 1mus secundo distincte latior; 2dus tertio vix longior.* (*Microxylobii typici.*)

21. *Microxylobius Westwoodii*, Chev.

Microxylobius Westwoodii, Chev., Trans. Ent. Soc. Lond. i. 98, pl. x. f. 6 (1836).

Having been unable to obtain a sight of this insect, I know nothing of it beyond what may be gathered from M. Chevrolat's original diagnosis. But I infer, from Mr. Westwood's excellent figure which accompanies it, that it is a member of the former of my two sections here indicated,—not merely in its unarmed femora and diminutive bulk (it being described as only *a line* in length, and therefore even smaller than the *M. lacertosus*), but also in the second joint of its funiculus being subequal to the third. In its brassy hue it would seem to accord with the majority of the species here characterised.

22. *Microxylobius lacertosus*, n. sp. (Pl. 18, fig. 5.)

M. elongato-ovatus, piceo-niger, sub-opacus, alutaceus; capite rostroque confertissime sed minus profunde punctatis (hoc subconvexo); prothorace longiusculo, subconvexo, confertissime punctato, ad latera minus rotundato; elytris subseriatim tuberculatis (haud punctatis) et leviter longitudin-

aliter costatis; antennis pedibusque breviusculis, rufo-piceis; tarsorum articulo antepenultimo minus dilatato.

Long. corp. lin. 1⅓.

This little *Microxylobius*, the smallest of the species here characterized (and apparently but slightly larger than M. Chevrolat's *M. Westwoodii*), may be at once known from the following ones by its comparatively undilated antepenultimate tarsal joint, its subopaque, alutaceous surface, and the peculiar sculpture of its elytra,—which are free from punctures, but are roughened by a set of minute, somewhat longitudinally-disposed tubercles, and have a series of obscurely elevated costæ, which are rather more apparent towards either side than near the suture. Its elytra, also, have their widest part a little *behind* the middle (which is not the case in any of the species enumerated below); its rostrum, too, is a little more convex on its upper side, its eyes are a trifle more prominent, its prothorax is longer and straighter (with the sculpture much more dense), and its four hinder legs are somewhat shorter than in its allies described below. Like the *M. lucifugus*, it is black; but it is more piceous than that insect, and has no trace whatever of a metallic tint, even on its elytra. There was but a single specimen of it amongst Mr. Bewicke's captures at St. Helena.

23. *Microxylobius lucifugus*, n. sp. (Pl. 18, fig. 6.)

M. fusiformis, niger, subnitidus; capite rostroque confertim et (præsertim in fœminis) profunde punctatis (hoc robusto et ad apicem in medio leviter depresso; in maribus subtriangulari, basi lato); prothorace convexo, profunde confertim et regulariter punctato, ad latera rotundato; elytris obsoletissime subænescentibus, subconvexis, rugulosis, leviter punctato-striatis, interstitiis latis confertim punctatis; antennis pedibusque robustis, breviusculis, piceis, illarum basi rufescentiore.

Long. corp. lin. 2.

A large and well-marked species; and one which may be readily distinguished by (*inter alia*) its rather thickened limbs, black hue (there being only the faintest possible tinge of æneous just traceable on the elytra), densely and deeply punctured, though but slightly shining, surface (which, however, is less opaque than in the *M. laccrtosus*), and by its subrugulose elytra. Two specimens of it (male and female) were collected at St. Helena by Mr. Bewicke.

B. *Funiculi articulus* 1*mus secundo vix latior; 2dus tertio multo longior.*

24. *Microxylobius terebrans*, n. sp. (Pl. 18, fig. 7.)

M. fusiformi-ovatus, æneus, nitidus; capite rostroque sat confertim et profunde punctatis; prothorace convexo, sat profunde punctato, ad latera rotundato; elytris convexis, leviter punctato-striatis, interstitiis latis punctatis, ad basin ipsam paulo ruguloso-asperatis; antennis tarsisque rufo-piceis, illarum capitulo minore, minus abrupto, ovato.

Long. corp. lin. $1\frac{2}{3}$.

If it should so happen (which, however, I think is not probable) that the curious development of an acute spine on the upper edge of the thighs in the two following *Microxylobii* should be a *sexual* character, it is possible that the present species (of which I possess only a pair of females) may be removed eventually into the next section; with the members of which, in the more elongated second joint of its funiculus and its brightly æneous hue, it better agrees. Still, in the absence of any appearance of a femoral spine, and under the impression that that structure is not a sexual one, I have no alternative but to include the *M. terebrans* in the same primary division with the *lacertosus* and *lucifugus*. In minor details, its shining brassy surface will at once distinguish it from any of the *Microxylobii* here described except the *M. Chevrolatii* and *conicollis;* from the latter of which it is altogether removed by the short-ovate outline, conical prothorax, arcuate upper surface, and peculiar antennæ, of that insect. From the *M. Chevrolatii* it may be immediately known by its smaller size, more ovate outline, more convex prothorax and elytra (the former of which is more deeply punctured), and by its rather smaller and less abrupt antennal club.

§ II. *Femora postica* (*in utroque sexu?*) *spinâ magnâ acutissimâ sub-basali supra armatis. Funiculi articulus* 1*mus secundo vix latior; 2dus tertio multo longior.* (*Microxylobii aberrantes.* —Subg. *Thaumastomerus*, Woll.)

25. *Microxylobius Chevrolatii*, n. sp. (Pl. 18, fig. 8.)

M. fusiformi-elongatus, læte æneus, nitidus; capite rostroque sat confertim et profunde punctatis; prothorace subconvexo, levissime punctulato, ad latera rotundato; elytris leviter punctato-striatis, interstitiis latis leviter punctatis, antennis tarsisque rufo-piceis, illarum capitulo abrupto, globoso-ovato.

Long. corp. lin. $2\frac{1}{2}$.

In spite of its analogy (however fanciful) in outward contour and hue (though not in *relative size*) with the Madeiran *Caulotrupis Chevrolatii*, I have an additional pleasure in dedicating this beautiful *Microxylobius* to M. Chevrolat, since it was he who first established the present genus. It may be at once recognized by its large size, elongate outline, brightly æneous hue, and very lightly punctulated prothorax. An important character, also, exists in the second joint of its funiculus, which is longer than is the case with the corresponding one in either the *M. conicollis* or *terebrans*,—it being not only *very much* more elongate than the third, but a *little* longer than even the basal one. Two examples of it, which (as I am inclined to believe) *may* represent the sexes, and both of which have a powerful spine towards the base of the upper edge of their femora, were amongst Mr. Bewicke's St. Helena collection.

26. *Microxylobius conicollis*, n. sp. (Pl. 18, fig. 9.)

M. breviter ovatus, æneus, nitidissimus; capite rostroque parce et leviter punctatis (hoc valde deflexo); prothorace conico (i. e. postice lato necnon ad latera oblique recto), parce et leviter punctato; elytris profundis sub-punctato-striatis, interstitiis latis leviter et parce punctatis; antennis pedibusque nigro-piceis, illis ad basin tarsisque rufescentibus.

The *M. conicollis* is so remarkable an insect that for some time I had conceived that it must be generically distinct from any of the preceding species. Indeed the structure of its funiculus and club (the former of which has its joints more conical, and more compact *inter se*, whilst the latter is longer and less abrupt), in conjunction with its shortly-ovate outline, its much deflexed rostrum, and its extremely glossy, slightly sculptured and *arcuate* upper-surface,—its prothorax being not only conical (i. e. broadest at the extreme base, and with the sides obliquely straight), but also *in a continuous curve* with the elytra,—giving it a character peculiarly its own. Nevertheless, in spite of these external singularities, in all essential respects it is moulded on the same type as the other *Microxylobii*,—the immensely developed spine on the upper edge of its thighs being merely somewhat larger than that of the *M. Chevrolatii;* whilst its internally-strigulose femora, obsolete scutellum, and the other details of its structure, are all coincident with the corresponding ones of the several members of the genus here described. A single specimen only of it was captured by Mr. Bewicke, during his visit to St. Helena.

Genus Pentatemnus, nov. gen. (Pl. 19, fig. 1.)

Corpus parvum, fusiforme, sculpturatum, parce sed longe et grosse pilosum: *rostro* breviusculo, latiusculo, tereti (ad antennarum insertionem haud ampliato), vix arcuato, paulo deflexo; *oculis* (ut in genere *Mesoxeno*) minutissimis, valde demissis, fere obsoletis (ægre observandis), e lentibus 5 vel 6 solum compositis; *scrobe* brevi, sat profundâ, infra oculum desinente et ibidem (sed haud argute) terminatâ: *prothorace* longiusculo, sub-conico, ad latera paulo rotundato; *scutello* obsoleto: *elytris* connatis: *alis* nullis: *abdomine* e segmentis 4 composito (suturis tribus profunde et argutissime impressis), 1mo maximo (e duobus confluentibus composito), 2do 3tioque brevissimis, 4to rotundato-triangulari. *Antennæ* (19, 1a) breves, crassæ, in utroque sexu vix pone medium rostri insertæ; *scapo* ad basin ipsam flexuoso, apice facile clavato; *funiculo* 5-articulato, 1mo magno crasso, reliquis longitudine sub-æqualibus, latitudine paulo crescentibus, ultimo clavæ haud arcte adpresso; *capitulo* solidissimo, globoso-ovato, apice obscurissime annulato et ibidem paululum piloso. *Pedes* breves, validi, sub-æquales, *antici* ad basin fere approximati, *intermedii* paulo distantiores, *postici* (19, 1b) valde distantes: *femoribus* crassis, clavatis, muticis: *tibiis* rectis, extus muticis (haud spinulosis), ad apicem externum in uncum maximum acutissimum valde deflexum (unco in posterioribus basi extus compresso-ampliato, necnon magis subito deflexo, quare nisi oculo valde obliquo superne haud observando), sed ad internum in spinam brevem parvam robustam, productis; *anticis* intus versus apicem longe pilosis: *tarsis* pseudotetrameris, filiformibus, crassiusculis, articulo 1mo longiusculo, 2do 3tioque paulo brevioribus sub-æqualibus (hoc vix dilatato et vix bilobo), 4to minutissimo, ultimo circiter primi longitudine, sub-clavato, *unguiculis* parvis simplicibus munito.

Obs. Genus corpore piloso aptero, oculis obsoletis tarsorumque articulo antepenultimo vix reliquis latiore, necnon pedibus sub-fossoriis habituque generali subterraneo generi *Leipommata* (Portûs Sancti) proximum; sed funiculo 5- (nec 7-) articulato, antennis brevioribus magis incrassatis, ab apicem rostri distantioribus, prothorace longiore conico, scutello omnino obsoleto, tarsis crassioribus uncisque tibiarum posteriorum acutioribus, multo magis subitoque deflexis (quare su-

perne haud observandis), necnon ad basin externam compresso-ampliatis, præter cæteras, discedit.

A πέντε, quinque, et τέμνω, seco.

In the anomalous construction of its minute, deeply-sunken and almost obsolete eyes, as well as in its escutellate apterous body, connate elytra and 5-articulated funiculus, the curious weevil from which the above details have been drawn is coincident with the Madeiran and Canarian *Mesoxeni;* nevertheless, in its much broader, shorter and less arcuated rostrum (which is of equal breadth throughout,* not being in the least degree widened at the point of insertion of the antennæ), as also in its more abbreviated and *much* less apically implanted antennæ (which spring from rather behind the middle, instead of at a considerable distance before it), its *hairy* surface, the outer basal-enlargement of its four hinder tibial-hooks, its almost undilated antepenultimate tarsal joint, and its extraordinary *burrowing* habits, it altogether recedes from those insects. Indeed there can be no doubt that it is far more intimately allied, in reality, to the curious *Leipommata calcaratum* from Porto Santo,—with which, in its unexapanded feet, *pilose* body (a most remarkable feature for an insect which resides deep underground, beneath shifting sand), and sub-fossorial mode of life, it entirely agrees; nevertheless, in *Leipommata* the funiculus is 7- (instead of 5-) articulate, the eyes are quite absent, the antennæ (although short) are longer and slenderer, and are inserted a little *before* the middle of the rostrum (instead of somewhat behind it), the scutellum is just traceable beneath the microscope, the hinder-tibiæ are sub-flexuose, the tibial-unci are less acute, and the four posterior ones *very* much less decurved† (so that they are quite apparent when the insect is viewed from above) and without any trace of the disproportioned development at their outer base.

* In this respect, as well as in the submedial position of its antennæ in both sexes (no less than in its 5-jointed funiculus), it agrees better with *Pentarthrum* than with *Mesoxenus;* but the fully developed eyes and scutella of the *Pentarthra*, in conjunction with their linear, *glabrous* bodies (the most essential feature of the typical *Cossonides*), smaller and ordinary tibial-hook (which is not enlarged into an obtuse, compressed process at its outer base), and their common lignivorous habits, will at once separate them from the whole of these blind, pilose, sub-fossorial, sand-infesting *Curculionidæ*.

† The sudden manner in which the four hinder tibial-unci are decurved in *Pentatemnus* is very remarkable,—being, in consequence, quite concealed from view unless the insect be examined laterally; whilst the compressed development *at the base* of these unci is, on the other hand, so apparent, that it seems *primâ facie* as though it *terminated* the tibiæ, and that there was no hook beyond it.

Thus, whilst *Pentatemnus* resembles in some respects *Leipommata* and in others *Mesoxenus*, its structural details entirely forbid its being associated with either of them; though I think that the characters which would tend to affiliate it with the former are the more important ones, and that it must be considered therefore as nearer akin to the Porto Santan genus than to the wood-feeding *Mesoxeni* of Madeira and Teneriffe.

I do not hesitate in regarding as "blind" the members of the present and three following genera, because, although it is only in two of them (*Onycholips* and *Leipommata*) that the eyes are *absolutely untraceable* beneath the highest power of the microscope, it is nevertheless equally certain that the others (*Pentatemnus* and *Mesoxenus*) have their visual organs so excessively imperfect, minute, deeply immersed and rudimentary, that they are strictly what would be termed "obsolete;" and there can be no doubt therefore, I imagine, that these latter ones likewise must be practically blind.

In spite of their many and important discrepancies (for the exponent of the second genus, in the construction of its almost incomprehensible feet, is perhaps one of the most extraordinary Coleopterous insects which has ever been made known) I am nevertheless convinced, after a long and careful consideration of them, that at any rate *the first three* of these groups are so closely allied that no system of classification, which would tend on account of those "discrepancies" to place them far asunder, can possibly be a natural one. Indeed, their want of sight, their coarsely-sculptured *pilose* bodies, obsolete wings and sub-fossorial habits (the insects residing underground at the roots of the few plants which stud the tracts of drifting sand in the eastern islands of the Canarian, and northern one of the Madeiran, Archipelago,) are all particulars, and very expressive ones, in which they are literally coincident. And, when we take into account the extreme peculiarity of their mode of life (for the *Rhynchophora*) and their remarkable feature of a *hairy* surface (especially for *Cossonides*, and for creatures, moreover, which live at a considerable depth in the sand—never rising to the surface except when brought there by accident or design), we shall be still further struck by the fact, that the habits of these Curculios are as marvellous as they are *identical inter se*.

If we may consider, therefore, their near relationship as a settled point, it becomes comparatively easy to discuss their affinities; for, had *the second of them only* (*Onycholips*) been brought to light, we might have had great difficulty in referring it

to any known sub-family or group—the structure of its four hinder tarsi and other minutiæ being quite unintelligible without the aid of some collateral form to suggest a partial explanation. But, granting its kinship with *Pentatemnus* and *Leipommata*, we at once connect it with the *Mesoxeni* (of Madeira and Teneriffe), which *Pentatemnus* manifestly approaches, and thence with *Pentarthrum* and the typical *Cossonides*.

The burrowing propensity of the representatives of these three genera (*Pentatemnus*, *Leipommata* and *Onycholips*) cannot be too prominently brought forward—not simply because of its eccentricity amongst the Cossonideous groups, but likewise because the whole details of their structure, except (*apparently*) their more or less hirsute bodies, are in perfect keeping with this instinct of their nature; for, whilst all of them are blind (eyes being useless for creatures which never intentionally approach the light) and apterous, *Leipommata* and *Pentatemnus* have the *inner* apical-angle of their tibiæ (a very rare circumstance in the *true Rhynchophora*) produced into an acute spine, their antepenultimate tarsal-joint (the usual dilatation of which implies a power of adhesion to the foliage and stems of plants) almost unexpanded, and their elytra connate; whilst in *Onycholips* the four posterior tibiæ are powerfully spinulose along their outer edge (after the fashion of many of the Lamellicorns), and have their feet (of which hereafter) most abnormally furnished with compressed divaricating spiniform lobes.

27. *Pentatemnus arenarius*, n. sp. (Pl. 19, fig. 1.)

P. angusto-ellipticus, piceus, pilis longis sub-erectis mollibus cinereis parce vestitus; prothorace longiusculo, sub-conico, valde profunde et distincte punctato; elytris transversim rugulosis, sub-seriatim punctatis; antennis pedibusque paulo rufescentioribus.

Occurrit pilis plus minus attritis,—corpore sub-calvo.

Long. corp. lin. $1\frac{1}{3}$—$1\frac{1}{2}$.

Habitat insulas Lanzarote, Fuerteventura et Gran Canaria, ad radices plantarum (præsertim *Zygophyllum Fontanesii*, Webb) in arenosis aridis submaritimis crescentium, hinc inde haud infrequens.

Although the present insect would never be found by any one who was unacquainted with its habits, it is nevertheless far from uncommon when searched for in its proper localities. It occurs,

generally, at a considerable depth underground, about the roots of various shrubby plants (particularly the *Zygophyllum Fontanesii*, Webb, and a small *Euphorbia*) which stud the dry barren sandy tracts of Fuerteventura, Lanzarote and Grand Canary, and around which solid hillocks have gradually accumulated from the loose surface-sand, which the constant breezes of those latitudes keep in an eternal state of drift. In such situations, by selecting a mound and scooping a large hole at the side of it (so as to catch everything that might chance to fall), and then laying bare the roots and stems immediately above it, I have at times taken the *Pentatemnus* in tolerable profusion—especially on the arid wastes in the vicinity of Porto de Cabras of Fuerteventura, and on those far more extensive ones at Corralejo (the extreme northern point of the island). In like positions I have found it, though more sparingly, near Arrecife, of Lanzarote, and at Maspalomas, in the south of Grand Canary.

Genus Onychiolips, nov. gen. (Pl. 19, fig. 2.)

Corpus parvum, sub-globoso-ovatum, sculpturatum, longissime et grosse pilosum: *rostro* brevi, latissimo, apicem versus vix angustiore (ad antennarum insertionem haud ampliato), vix arcuato, deflexo; *oculis* nullis; *scrobe* brevissimâ, profundâ, flexuosâ, valde obliquâ (sc. foveolâ auriculiformi solum): prothorace breviusculo, ad latera rotundato: *scutello* distincto, triangulari: *elytris* liberis: *alis* nullis: *abdomine* e segmentis 5 composito, 1mo sat magno, 2do brevi, 3tio 4toque brevissimis, 5to rotundato-triangulari. *Antennæ* (19, 2 a) brevissimæ, crassæ, in utroque sexu prope medium rostri insertæ; *scapo* brevissimo (in scrobe auriculiformi profundâ omnino abscondito), sub-flexuoso, gracili; *funiculo* 6-articulato, articulis 1mo et 2do maximis crassis latitudine sub-æqualibus (illo paulo breviore transverso-rotundato, hoc sub-ovato apice late truncato) et pilis paucis longissimis obsitis, reliquis parvis brevibus sub-æqualibus, ultimo clavæ sat arcte adpresso; *capitulo* magno, solidissimo, globoso-ovato, apicem versus densissime et sat longe piloso. *Pedes* breves (*antici* brevissimi), validissimi, fossorii, *anteriores* ad basin approximati, *postici* (19, 2 c, 2 d) valde distantes: *femoribus* crassiusculis, sat clavatis, muticis: *tibiis anticis* (19, 2 b) rectis extus haud spinulosis, ad apicem externum in lobum tectiformem obtusum longissimum læte translucidum, sed ad internum in spinam parvam valde compressam, productis; *posterioribus* sub-curvatis, extus fortiter spinulosis, ad apicem (externum et in-

ternum) valde compressis et lobato-ampliatis : *tarsis* brevibus, valde anomalis, pone tibiarum apicem compressum lobatum insertis, quasi 4-articulatis (articulo ultimo vel vere vel quasi obsoleto!) ; *anticis* (19, 2 b) vere 4-articulis [articulus ultimus omnino abest], brevissimis, longissime pone apicem tibiarum lobatum sitis et lobo ipso brevioribus [ergo superne haud observandis], filiformibus, articulo 1mo brevi, 2do longiore, 3tio hoc paulo breviore, 4to præcedenti vix minore, regulariter ovali necnon ad apicem pilis perpaucis longissimis obsito ; *posterioribus* (19, 2 c, 2 d) quasi 4-articulatis [articuli ultimus et penultimus nisi fallor inter se omnino commiscentur, articulum, aut potius appendiculam bifurcatam, anomalam, efficientes], articulis 2do, 3tio et ultimo ad angulos anticos longissime spinoso-lobatis (articulos 3 longe bifurcatos formantibus!)—articulo 1mo brevi-ovato apice truncato, intra apicem compressum tibiarum abscondito, 2do majore longiore, unâ cum 3tio (minore graciliore) lobis duobus spiniformibus longissimis aucto, 4to nisi fallor minuto inter spinas tertii immerso et in ultimum (apice bifurcatum, sed haud unguiculatum) omnino suffuso.

Obs. Genus valde anomalum, scapo brevissimo (in scrobe auriculiformi omnino abscondito), funiculo 6-articulato (articulis 1mo et 2do maximis crassis subæqualibus, reliquis minutissimis), corpore sub-globoso longissime piloso cæco, habituque subterraneo fossorio necnon tibiarum tarsorumque structurâ mirificâ abnormali Curculionidis omnibus mihi cognitis toto cælo differt.

Ab ὄρυξ, unguiculus, et λείπω, relinquo.

In its marvellously reduced antennal scape (which is so excessively short as to lie entirely buried within the deep fovea, or abbreviated *scrobs*, in which it is implanted), as well as in the very unusual proportions of its *six*-jointed funiculus, its total freedom from even the rudiments of eyes, and its most wonderful tibiæ and feet, this extraordinary genus presents a combination of features perfectly anomalous, and which I believe are quite unparalleled in any Coleopterous insect on record. Indeed, the structure of its tibiæ and tarsi are so outrageously abnormal, that, did not the general outward contour of the creature, and the formation of its rostrum, oral organs and antennæ (not to mention its *superficial* points of resemblance with the exponent of the preceding genus), bespeak it as Rhyncophorous, it would have been quite impossible to decide to what primary division of the *Coleoptera* it should be referred. And although even now I may be mistaken

in the conclusions which I have drawn, I may add that, had I not mounted in balsam many specimens of the legs for microscopic observation, and thus fixed them in so *transparent* a medium that their *inner* structure became visible, I do not think I could have offered any explanation of a foot which seemed to have nothing in common with the ordinary Coleopterous type.

Whilst examining the tibiæ and tarsi of this Canarian "monster"* (in balsam) under the microscope, one might almost imagine (however fancifully) that one could trace out the mode of its development in arriving at its present erratic climax; for it would seem as if the tibiæ had been gradually *increased* by a narrow, compressed, lateral, spinulose marginal-*appendage*, which had become so enormously developed at the tip as to have almost doubled the original length of the limb,—so that the tarsi, which are implanted into the apex of the *true* tibiæ, arise immensely behind the lobed termination of what I may be perhaps permitted to call (by way of illustration) the *pseudo*-tibiæ. In the front-legs (19, 2 b), which are excessively short, this compressed marginal rim is hardly at all developed *along the edge*,—where it is just traceable (under a high power) as a hair-like line armed with one or two rudimentary infinitesimal spines; but *at the apex* it is produced into a long, obtuse, roof-shaped lobe,† or finger, concave beneath and far exceeding the tarsus in length,—which is consequently entirely hidden when viewed from above. In the four hinder tibiæ (19, 2 c, 2 d) this compressed lateral "appendage" is much more developed, and powerfully spinulose along its outer edge; and at the apex it is greatly enlarged,—stretching out, moreover, into elongated lobes which occupy the relative positions of the internal and external angles of the "*true*" *tibia*, and which almost conceal from observation the basal joint of the tarsus (which arises out of the latter).

Thus much for the tibiæ,—the structure of which, however anomalous (especially for the *Rhynchophora*), is intelligible enough. Not so, however, the feet,—which, although on a perfectly different type in the front-legs to what they are in the remainder, may be all regarded as tetramerous,‡ the apical joint having either

* Length, one line!

† This tectiform finger, or lobe, has a very beautiful appearance, even under an ordinary lens, when seen in particular lights,—reflecting from its thin surface a rich sanguineous iridescence. And indeed *all* the compressed spines, both of the tibiæ and tarsi, show more or less of this peculiarity; though, from their excessively minute dimensions, it is in them less conspicuous.

‡ It may perhaps be said, that I have described from imperfect specimens,—

become merged with that which precedes it (as I believe to be the case with the hinder ones), or else (as I am inclined to think probable in the anterior pair) entirely lost.

The front-tarsi (19, 2b) are very short, slender and small; and, since they do not equal in length the apical projection of the tibia, they are only visible when the insect is looked at obliquely, when they may be seen hanging loosely down, as though weak and abortive,—a peculiarity which is at once confirmed on inspection, for they have every appearance of being useless. They would seem to be composed of four joints of sub-equal breadth,—the second being a little the longest, and the ultimate one regularly oval and furnished at its tip with a few long hairs. There is no indication whatever of *unguiculi*, and therefore, as the whole number of articulations (so far as I can detect them) is only four, I conclude that the *claw-joint* must be the missing one. So abbreviated indeed are these feet, and so cumbersome must be the elongate overhanging tibial-lobe, that one can scarcely understand how they could possibly be brought into play; but whether their present abortive and imperfect state can have any connection with this fact, or whether the outrageous and most anomalous development of the four hinder tarsi can have had any correlative tendency to weaken the structure of the front ones, it is useless to conjecture.

The four posterior feet, however, constitute the chief anomaly of this remarkable Curculio; and it was not until I had looked at them for a considerable time, and had thought over them for many days, that I felt at all satisfied about the nature of their real structure; for their first appearance (19, 2d) is simply that of three apically-bifurcate portions, or joints, arising one out of the other in succession, and each of them diminishing in breadth, as well as in the length of these enormously-developed lateral spiniform lobes. On mounting them, however, in balsam, and throwing a strong light through them from beneath (*vide* 19, 2c), a basal articulation (which was concealed before within the double and compressed apical-enlargement of the tibia) became at once apparent; whilst, at the same time, I was able to detect in the following transparent joints distinct indications of what would seem to have been (speaking metaphorically) the size and shape of the *original* joints before the present immense lateral appendages were

which indeed I was, myself, at first inclined to suspect; but I can only say that I have mounted carefully twelve legs in balsam, and have examined, as opaque objects, those of *twelve more examples* (amounting, on the whole, to eighty-four limbs), and I find no exception to the above statement.

added to them. Thus, on this principle, the first articulation (now hidden within the augmented tibial-apex) appears to have been short and small, the second one (now furnished with these two immense spiniform lobes) much larger and slightly emarginate at its front edge, the third (likewise armed with these elongate lateral appendages) rather smaller and slenderer, and a little more decidedly emarginate at its apex, whilst the ultimate one (at the base of which I *believe* I can discern evidences of the minute penultimate joint of the ordinary pseudotetramerous foot) would appear to have terminated *before* the base of the two (comparatively short) divaricating and exceedingly thin lobes which now crown its apex.

On this explanation (which I believe to be really correct), the foot is reduced from a perfectly incomprehensible type to an intelligible one; and although (to make my meaning more plain) I have used the term "development," &c., in speaking of these abnormal spiniform lobes, I do not mean thereby to express my conviction that the latter *have actually* been added to a foot which was originally formed after the fixed Rhynchophorous pattern; but simply that that type has not altogether been lost sight of in even this extravagant modification of it.

Since the "developments" at the apex of the tibia of this Curculionideous monster, and which so marvellously increase the length of what I have (somewhat fancifully) designated the "original" limb, follow the exact relative positions of the ordinary tibial spur and hook (at the internal and external angles, respectively); and since the spiniform lobes of the second and third tarsal joints likewise arise from the *angles* of those articulations (as though they were enormous prolongations of them); I therefore conclude, from analogy, that the two (smaller) terminal lobes of the *last* tarsal-joint follow the same law, and may be regarded, consequently, as prolongations of the *angles* of that joint, and have nothing whatever to do with the *unguiculi*,—which they, therefore, do *not* represent. And, in support of this, the evident indications that are present may be adduced of the claw-joint having (as it were) terminated *before* the base, or commencement, of this bifurcated "appendage." Or we may state it thus:—since the claws are altogether absent in the *front*-feet, it would appear the less improbable *à priori* that they might have become also obsolete in the posterior ones,—absorbed (as it were), if I may so express it, by this anomalous development of spiniform lobes; in which case the lobes could not be said to *represent* them,

though they might be regarded as the proximate cause of their extinction.

With respect to the minor generic details of this curious insect, space forbids me to comment on them,—so I must merely refer to the diagnosis. I may just add, however, that it differs *inter alia*, from *Pentatemnus* in having its *scutellum* distinct and its *elytra* free, in its four anterior legs being approximate at their base, and in the remarkable confirmation of its antennæ (19, 2 a),—the scape of which (as already stated) is so minute as to be quite buried in the small *scrobs*, or auriculiform fovea, in which it is implanted; whilst the *funiculus* is 6-articulate (the first two joints being very large and thick, and the remaining four short and small); and the *capitulum* most densely pilose towards its apex.

28. *Onycholips bifurcatus*, n. sp. (Pl. 19, fig. 2.)

O. globoso-ovatus, pallido-ferrugineus, rostro ad apicem ipsum nigro, pilis longissimis erectis mollibus flavo-cinereis vestitus; prothorace parvo, coleopteris angustiore, ad latera (præsertim postice) rotundato, punctato (punctis maximis sed leviter impressis); elytris rugosis, substriato-punctatis (punctis maximis sed leviter impressis confusis) et minutissime subseriatim tuberculato-asperatis; antennis pedibusque vix pallidioribus.

Long. corp. lin. 1—1$\frac{1}{3}$.

Habitat insulas Fuerteventura et Gran Canaria, in locis similibus ac *Pentatemnus arenarius* et unà cum illo degens, sed multo rarior: ad radices *Zygophyllum Fontanesii* prope Puerto de Cabras Fuerteventuræ sat frequens, necnon inter urbem Las Palmas et viculum Puerto de Luz, Canariæ Grandis, exemplar unicum cepi.

Occurs at the roots of shrubby plants, in company with the *Pentatemnus arenarius*, but very much rarer. In the sandy region to the south of Puerto de Cabras, of Fuerteventura, it was taken sparingly, both by myself and Mr. Gray; and I found a single specimen of it in Grand Canary, on the sandy isthmus (between Las Palmas and Puerto de Luz) which connects the Isleta with the mainland.

Genus Leipommata. (Pl. 19, fig. 3.)

Woll., Cat. Mad. Col. 100 (1857).

The curious weevil which was detected by myself in Porto Santo, at the roots of sand-plants, during May of 1855, and for

the reception of which I founded (in 1857) the present genus, is, as has been already stated, so closely allied in external aspect and contour to the *Pentatemnus arenarius* (found in similar spots in the three eastern islands of the Canarian archipelago), that at first sight it would undoubtedly be regarded as congeneric with it. Yet, in spite of this wonderful similarity in *facies* and habits, the *Leipommata calcaratum* recedes from *Pentatemnus* in many of the most important details of its structure,—though especially, perhaps, in possessing a 7- (instead of a 5-) jointed funiculus. In their *pilose* bodies and sub-fossorial habits (two most remarkable characters for the *Cossonides*), as well as in their subconnate elytra, obsolete wings, almost unexpanded antepenultimate tarsal-joint, and the more or less produced (or spiniform) *inner* apical-angle of their tibiæ, the two insects are nearly coincident; nevertheless, in *Leipommata* the eyes are entirely absent (there being no indication of them whatsoever, even beneath the microscope); the antennæ (although short) are rather longer and thinner, and implanted a little nearer to the apex of the rostrum; the prothorax is smaller and less conical, the scutellum is not quite obsolete (being just traceable under a high magnifying power), the tarsi are slenderer, and the apex of the tibiæ is very differently modified,—the large outer hook (vide 19, 3 b) being more obtuse and very much less deflexed (so that the four hinder ones are quite apparent when the insect is viewed from above), whilst the inner terminal-spine is considerably larger and more elongated. In *Leipommata*, moreover, the hinder tibiæ are less straightened than in *Pentatemnus*, and the base of their apical-hook is not compressed and developed as is the case in that genus.

29. *Leipommata calcaratum*, Woll. (Pl. 19, fig. 3.)

Leipommata calcaratum, Woll., Cat. Mad. Col. 101 (1857).

Habitat Portum Sanctum (insularum Maderensium), ad radices plantarum (præsertim *Arundo donax*) in colliculis arenosis mox pone oram maritimam crescentium, mense Maio A.D. 1855 a meipso repertum.

Taken sparingly at the roots of sand-plants (especially the common *Arundo donax*), and generally at a considerable distance beneath the surface, on the sand-hills of Porto Santo (immediately behind the sea-beach), during May, 1855.

Genus Mesoxenus, nov. gen. (Pl. 19, figs. 4, 6.)

I need not give the structural details afresh of the two singular

insects for the reception of which I would now propose the present genus. In a late paper on "Additions to the Madeiran Coleoptera," published in the "Annals of Natural History" for last year, I described these species minutely, and, whilst recording them as *aberrant Pentarthra*, stated the exact points in which they differed from *Pentarthrum proper*,—as then solely represented by the *P. Hattoni*, from the west of England. I will simply add, therefore, that the detection by Mr. Bewicke of a second *Pentarthrum*, in the island of Ascension, has so completely confirmed my original diagnosis of the group (enabling me, *inter alia*, to pronounce for certain, what I was formerly only able to suspect, that the antennæ are in *both* sexes strictly medial), that I can no longer admit into it the two weevils enumerated below,—the characters of which are very different from the corresponding ones of the veritable *Pentarthra:* indeed, the possession of a 5-jointed funiculus is almost the only essential peculiarity in which the members of this genera agree.

The *Mesoxeni* are at once separated from the *Pentarthra* by their almost obsolete eyes* (which are so extremely rudimentary and abortive that there can be but little doubt that the creatures must be practically blind), by their quite obsolete scutella, by their longer, narrower, and more arcuated rostra, which is slightly widened at the point of junction of the antennæ, and by these latter being very decidedly *ante-medial* in their insertion. The *Mesoxeni*, also, are more convex, fusiform and less roughened insects than the *Pentarthra* (which are narrow, parallel and deeply sculptured, like the *Mesites* and *Cossoni*); and their prothoraces are less conical,—being rounded at the sides, instead of being widest at the extreme base.

30. *Mesoxenus Monizianus*, Woll. (Pl. 19, fig. 4.)

Pentarthrum Monizianum, Woll., Ann. of Nat. Hist. (Ser. 3), v. 450 (1860).

Habitat insulas Maderenses et Canarienses, rarissimus: specimen unicum mense Martio A. D. 1857 ad Orotavam Teneriffæ primus deprehensi, sed tempore vernali 1858 in horto quodam Funchalensi Maderæ copiosior collegit Dom. Moniz.

Apparently extremely rare, or at any rate very local; and the only one of the Atlantic *Cossonides* which has hitherto been ob-

* For a description of these eyes, *vide* "Annals of Natural History" (Ser. 3), v. 450 (1860).

served in more than a single island-group. A solitary specimen of it was taken by myself, in a house at Orotava, in the north of Teneriffe, during March, 1857; and many more were captured by Sr. Moniz, in Madeira, during the spring of 1858,—from out of old boards lying on the damp earth in his garden at Funchal.

31. *Mesoxenus Bewickianus*, Woll. (Pl. 19, fig. 6)

Pentarthrum Bewickianum, Woll., Ann. of Nat. Hist. (Ser. 3), v. 451 (1860).

Habitat Maderam australem, in ligno antiquo a Dom. Bewicke repertus.

Likewise very scarce,—or, at any rate, extremely local; and hitherto found only by Mr. Bewicke, amongst rotten wood in a small shed, or out-house, at the Praia Formosa, near Funchal.

Genus Pentarthrum. (Pl. 19, fig. 5.)

Woll., Ann. of Nat. Hist. (Ser. 2), xiv. 129 (1854).

The genus *Pentarthrum* was established by myself, in 1854, for the reception of a small weevil discovered by my nephew, the Rev. H. W. Hutton, during the previous year, in Devonshire; and, with the exception of *Microxylobius*, it was the first true member of the *Cossonides* in which *less than seven* funiculus-joints had been observed. Since then, however, I have myself described four other Cossonideous genera, in which the articulations of this portion of the antennæ are numerically reduced,—namely, *Hexarthrum* and *Onycholips*, in which the number of joints are six; and *Pentatemnus* and *Mesoxenus*, in which it is five; so that, up to the present date, there are four known groups of this subfamily which possess a 5-jointed funiculus,—*i.e.*, *Microxylobius* (from St. Helena), *Pentatemnus* (from the Canary Islands), *Mesoxenus* (from Madeira and the Canaries), and *Pentarthrum* (from the south-west of England and Ascension).

As already stated (in my observations under the preceding genus), the recent detection by Mr. Bewicke, at Ascension, of a new *Pentarthrum*, has so completely confirmed my original diagnosis of the group (proving, amongst other important particulars, that the antennæ are *in both sexes* strictly medial), that it is impossible to include under it any longer the two curious Madeiran beetles which (from a dislike to multiplying genera) I had characterized last year (in the "Annals of Natural History") as *aberrant Pentarthra*, under the respective titles of *P. Monizianum* and *Bewickianum;* and I have consequently just proposed for these

latter the generic name of *Mesoxenus*. And, in point of fact, *Mesoxenus* and *Pentarthrum* (each of which have now two known exponents) are remarkably well-defined *inter se*, and cannot possibly be confounded; for not only has the latter large and fully-developed eyes and a distinct scutellum (whilst the former is escutellate, and almost, if not entirely, blind), but its antennæ are inserted, also, much further from the apex of the rostrum—which latter is broader, less arcuate, and of *perfectly equal breadth throughout*. The *Pentarthra*, likewise, are more linear, parallel and deeply sculptured insects than the *Mesoxeni* (resembling the typical *Cossonides*),—being less fusiform, and with their prothoraces (instead of dilated at the sides) sub-conical.

The only structural differences that I can possibly detect between the British and Ascension *Pentarthra* are, that the latter has the joints of its funiculus (*vide* 19, 5 a) a little more compact—with the second one not at all longer than the third (all except the enlarged one at the base being of sub-equal length)—its club smaller, more ovate, and less abrupt, and its third tarsal articulation less expanded and bilobed; but certainly such slight discrepancies (which are merely in *degree*, and not in kind) cannot be regarded, in the present instance, as of more than secondary importance.

The habits of both of these genera are somewhat peculiar, their exponents appearing to have a decided partiality for decayed wood in (what one would conceive to be) its *least* nutritive or attractive state; such as old, used-up planks, rotten boards, and portions of boxes, lying on (and often buried in) the damp earth, and, moreover, as much removed from the light as possible. In such positions both of the *Mesoxeni* were observed (one by Sr. Moniz and the other by Mr. Bewicke); as also the *Pentarthrum cylindricum*, at Ascension; and, to a certain extent, indeed (i. e. amongst cut-up wood in an out-house, and not in the open country), the *P. Huttoni* likewise.

32. *Pentarthrum cylindricum*, n. sp. (Pl. 19, fig. 5.)

P. angusto-cylindricum, piceo-ferrugineum, subnitidum, glabrum; rostro (præsertim in maribus) latiusculo, in utroque sexu (præcipue ad basin) sat profunde punctato, lineari, subrecto, oculis magnis, leviter prominulis, fronte sub-convexâ; prothorace elongato cylindrico-conico, valde profunde punctato, ad latera oblique recto (quare ad basin ipsam, quam alibi latiore); elytris sub-rugulosis, striato-punctatis, interstitiis minutissime seriatim punctulatis; antennis ad basin

pedibusque vix rufescentioribus ; antennis tarsisque brevibus ; articulis funiculi inter se compactis, secundo reliquis (sequentibus) haud longiore, capitulo ovato parvo minus abrupto; tarsorum articulo antepenultimo minus dilatato, præcedentibus vix latiore et obscure bilobo.

Long. corp. lin. $1\frac{1}{2}$.

Habitat in ins. Ascension, a dom. Bewicke mense Aprili A.D. 1860 captum.

The present *Pentarthrum* differs from the English *P. Huttoni*, not only in its smaller size, narrower outline, and more cylindric body, but likewise in its broader, shorter and more deeply punctured rostrum, more convex forehead and larger eyes, in its rather more transverse scutellum, its straighter and more cylindrical prothorax—the broadest part of which is at the extreme base (where it is of the exact breadth of the elytra), and not just before it as in that species,—and in its rather less rugulose elytra, which have a somewhat less evident tendency to be separately rounded-off at their respective apices.

Many specimens of it were detected by Mr. Bewicke, during April of 1860, "in the decayed wood at the bottom of some boxes," which he *suspects* had been used for importing plants into the island,—*probably* either "from the Cape of Good Hope or the Mauritius." It follows, therefore, that the insect is but a doubtful native of Ascension, and that its presence there may have been only accidental. Still, its close affinity with the British species, and its no distant relationship with the two *Mesoxeni* from Madeira and Teneriffe, would make it at least unlikely that so remote a spot as the Mauritius should be its proper country,—a conclusion which its admixture (at Ascension) with a single example of the minute *Cryphalus aspericollis*, which also occurs in both the Madeiran and Canarian groups, would not tend to invalidate.

Genus Stenotis. (Pl. 19, fig. 8.)

Woll., Ins. Mad. 316, tab. vi. f. 5 (1854).

Concerning the present genus I have nothing to add beyond the remarks given in the "Insecta Maderensia." The excessively narrowed outline, pallid hue, sub-pubescent and less hardened surface of the extraordinary little weevil for which it was established,—which, moreover, has its antennæ inserted considerably behind the middle of its (much porrected and slender) rostrum, its antepenultimate tarsal joint considerably expanded and bilobed, and its prothorax and elytra straightly truncated (rather than sinuate) at

their respective bases,—will suffice to distinguish it from all the other Atlantic *Cossonides* hitherto described. Upon the whole, however, it has perhaps more in common with the *Pentarthra* than with anything else here enumerated, with which in its parallel body and fully-developed scutellum it agrees; nevertheless, its 7-jointed funiculus and sub-pubescent surface will of themselves (apart from its many other, and conspicuous, differential characters) at once separate it from those insects.

33. Stenotis acicula, Woll.

Stenotis acicula, Woll., Ins. Mad. 316, tab. vi. f. 5 (1854).
Id., Cat. Mad. Col. 104 (1857).

Habitat Maderam borealem sylvaticam, rarissima, folia laurorum destruens.

The *S. acicula* is excessively rare, and confined, so far as I have hitherto observed, to the laurel-woods of the densest and most inaccessible regions in the north of Madeira,—off the *foliage* of which I have, on three separate occasions, brushed it (though very sparingly). I first detected it, on the 23rd of July, 1850, in the remote sylvan district of the Lombo dos Pecegueiros, towards the eastern edge of the Ribeira de João Delgada,—in which same locality I again captured it, on the 26th of the same month, in 1855; as also, a few weeks later (on the 19th of August), in the Ribeira do Ponteclaro, a small tributary ravine of the Ribeira de São Jorge.

Genus Mesites. (Pl. 19, figs. 7, 9.)

Schönherr, Gen. et Spec. Curc. iv. 1043 (1838).

The genus *Mesites* is a very important one in the Madeiran and Canarian islands, not so much however from the number of its species as from that of its individuals,—though, at the same time, it will probably be admitted that *seven* well-defined exponents are sufficient for us to consider it largely represented even as regards the *former* also. So far as I have hitherto observed, the Atlantic *Mesites* are either confined to the laurel-woods of intermediate and lofty elevations (where they do the work of devastation on a considerable scale), or else to the rotten *Euphorbia*-stems of all altitudes (even down to the level of the sea-shore). In the former case they are moulded on a large type, all more or less (and some very closely) related to the *M. Tardii** of the south-western por-

* The *M. Tardii* differs from the whole of these closely allied species (i. e. the three Canarian and two Madeiran ones), *inter alia*, in being more convex and

tion of the British Isles, and to the *pallidipennis* of the Mediterranean latitudes; the others are smaller, more or less fusiform (i. e. not so parallel) in outline, and are even still more gregarious than their allies. In both sections, however, they are eminently variable, as to stature,—some examples being *more than double* the size of others; so that it is necessary to have an extensive series* in order to determine the specific limits, and to draw out their several diagnoses correctly.

§ I. *Corpus plerisque sat magnum, parallelum; femoribus omnibus muticis.*

34. *Mesites complanatus*, n. sp.

M. atro-piceus (rare piceus), latiusculus, valde depressus, fere calvus; fronte inter oculos profunde longitudinaliter foveolatâ; prothorace valde profunde et sat crebre punctato, distincte carinato necnon postice in medio impresso, ad latera rotundato-ampliato; elytris valde profunde crenato-striatis (striis magnis latissimis), interstitiis angustis costatis; antennis piceis; pedibus nigro-piceis.

Mas.—Rostro elongato, punctulato, ad antennarum insertionem paulo rotundato-ampliato.

Fœm.—Rostro breviore, graciliore, tereti, polito, rufo-piceo, mox pone antennarum insertionem (*i. e.* mox ante basin ipsam) paulo ampliato.

Long. corp. lin. 3—5½.

Habitat regiones editiores sylvaticas ins. Palmæ, sub cortice laurorum laxo hinc inde sat vulgaris.

shining, in its male rostrum being more *quadrately* expanded at the implantation of the antennæ, and in that of its female sex having its small dilatation a little further removed from the anterior margin of the eyes, as well as by its elytral interstices being less evidently punctulated.

* I may add that, out of 1,035 specimens of the Madeiran and Canarian *Mesites* which I have lately examined (and which are exclusive of those which have formerly passed under my eye), I find them distributed as follows:—which will serve to show, *inter alia*, that the sexes are pretty equally abundant:—

	♂	♀	
complanatus	66 +	69 =	135
persimilis	70 +	87 =	157
maderensis	80 +	124 =	204
Euphorbiæ	13 +	22 =	35
proximus	2 +	0 =	2
fusiformis	274 +	220 =	494
pubipennis	5 +	3 =	8
	510 +	525 =	1,035

The present large and beautiful *Mesites* (which, so far as I have hitherto observed, appears to be peculiar to the island of Palma), may be known readily from the following one by its broader outline, more depressed, deeply sculptured surface, and darker hue. Its prothorax is wider, and more rounded at the sides than is the case in that insect, with its punctures considerably larger and less dense, and its central keel more evident; whilst its elytral striæ are *much* deeper, wider, and more coarsely crenated, and the interstices proportionably narrower and more costate, or convex. I took it, not uncommonly, beneath the loose outer bark of the native laurels, in the dense sylvan ravines of Palma, at rather a high elevation, especially the Barranco da Agua and the Barranco de Galga,—during my residence in that island, with the Rev. R. T. Lowe, in May and June of 1858.

35. *Mesites persimilis*, n. sp.

M. piceus vel rufo-piceus, sub-depressus, fere calvus; fronte inter oculos profunde longitudinaliter foveolatâ; prothorace sat profunde et creberrime punctato, obscure carinato necnon postice in medio impresso, ad latera minus rotundato-ampliato; elytris sat profunde crenato-striatis, interstitiis paulo convexis; antennis pedibusque rufescentioribus.

Mas.—Rostro elongato, punctulato, ad antennarum insertionem paulo rotundato-ampliato.

Fœm.—Rostro breviore, graciliore, tereti, polito, rufo-piceo, ad antennarum insertionem (*i. e.* mox ante basin ipsam) paulo ampliato.

Long. corp. lin. $2\frac{1}{2}$—5.

Habitat in locis similibus ac præcedens, sed in ins. Teneriffâ (nec Palmâ).

The *M. persimilis*, which abounds in certain spots within the sylvan regions of Teneriffe, is narrower, less depressed, more piceous, and (on the average) rather smaller than its Palman representative; its prothorax, also, is less rounded, or widened at the sides, more closely and less deeply punctured, and with its central keel less distinct; whilst its elytra have their striæ very much narrower and less deeply crenated and their interstices (proportionably) broader and less convex.

Both the present *Mesites* and the last one belong more particularly to the same type as the *M. maderensis* and the British *M. Tardii*; and, indeed, the *persimilis* is very closely allied to the former,—with which I had at first imagined it to be identical. It may, however, be at once known from it through its almost

entirely wanting (as in the case also with the *M. complanatus*) the fine elytral pubescence which is so conspicuous in the Madeiran species; its prothoracic keel, also, is more obscure; and its elytra are less convex, with their striæ much broader, deeper and more coarsely crenulated. In both of these Canarian species the eyes are rather smaller, and more oblong than in the *M. maderensis*.

36. *Mesites maderensis*, Woll.

Mesites maderensis, Woll., Ins. Mad. 319 (1854).
Id., Cat. Mad. Col. 104 (1857).

Habitat in editioribus Maderæ sylvaticæ, sub cortice laurorum laxo hinc inde valde gregarius.

The *M. maderensis* may be regarded as representing in Madeira the Teneriffan *M. persimilis*,—to which, indeed, as already stated, it is closely allied. Like that species, it occurs beneath the loose bark of the native laurels, attaining its maximum at a rather lofty elevation, and never descending below the sylvan districts.

37. *Mesites Euphorbiæ*, Woll.

Mesites Euphorbiæ, Woll., Ins. Mad. 318 (1854).
Id., Cat. Mad. Col. 104 (1857).

Habitat Maderam, truncos Euphorbiarum emortuos, ab orâ maritimâ usque ad regiones sylvaticas crescentium, destruens.

The present *Mesites* is the *Euphorbia*-destroying species of Madeira,—doing the work of destruction on apparently as large a scale in that island, as the *M. fusiformis* does at the Canaries. Up to a comparatively recent period I had observed it only in the rotten stems of the gigantic *Euphorbia mellifera* of lofty elevations; but on the 23rd December, 1858, I took it in equal profusion from out of the decayed branches of the *E. piscatoria*, on the low rocky slopes towards Caniço, to the east of Funchal,—in which locality, as well as in others, it has subsequently been captured both by Sr. Moniz and Mr. Bewicke. It is probably, therefore, independent of elevation, occurring indiscriminately wherever the Euphorbias are found. It may be at once known from the Canarian *M. fusiformis* and *pubipennis* by, *inter alia*, its more parallel (or less fusiform) outline, less shining surface, and very much paler (or ferruginous) hue, by its prothorax being more uniformly punctured (and free from the *larger* additional punctures which are there so conspicuous on the hinder portion of the dorsal line), by its elytra having their striæ strictly *crenated*, instead of punc-

tate, and the interstices minutely rugulose, by its less foveolated forehead, and by the antennæ of its females arising just perceptibly nearer to the extreme base of the rostrum.

38. *Mesites proximus*, n. sp.

M. inæqualiter badio-piceus, depressus, subopacus, fere calvus, fronte inter oculos profunde foveolatâ; prothorace distinctius alutaceo, in disco parce et minus profunde punctato, carinato necnon postice in medio impresso et ibidem punctis maximis notato, ad latera rotundato-ampliato; elytris vix pubescentioribus, per suturam nigrescentibus, profunde crenato-striatis (striis latis), interstitiis subconvexis; antennis pedibusque rufescentioribus, funiculi articulis breviusculis.

Mas.—Rostro punctulato, ad antennarum insertionem paulo rotundato-ampliato.

Fœm.—Adhuc latet.

Long. corp. lin. $2\frac{2}{3}$—$3\frac{1}{3}$.

Habitat Teneriffam, ad "Taganana" mense Maio A.D. 1859, a meipso repertus.

Of this insect I can at present find but two specimens amongst my Canarian material, though it is very probable that more may be brought to light when I have had time to overhaul my numerous boxes more completely. They offer such decided characters of their own, that, although unwilling to erect additional species without a large number of examples for comparison, I cannot possibly refer them to any of the Atlantic *Mesites* hitherto detected; though I think they have a greater affinity with the Madeiran *M. Euphorbiæ* than with anything else. They were taken by myself at Taganana, in the north of Teneriffe, during May, 1859; but whether in the laurel-woods on the mountains above the village, or in the *Euphorbia*-stems towards the coast, I am unfortunately unable to recall, though I am inclined to *suspect* that they were brushed from off the foliage of Euphorbias in the sylvan region on the ascent to the Cumbre.

In outline the *M. proximus* is a trifle less parallel than the preceding members of this section, though its elytra have only a faint tendency to the posterior-attenuation which is so very evident in the two exponents of the following one; their male-femora, however, have not any appearance of that obtuse, subdentiform projection, on their under side, which characterizes the *M. fusiformis* and *pubipennis*. It is a little smaller and more depressed than the *persimilis*, its colour is more cloudy, or *un-*

equal (after the fashion of tortoise-shell), its prothorax is more rounded at the sides, rather coarsely alutaceous, and very much more finely and remotely punctured (and with comparatively larger *additional* punctures in its central basal depression), its elytra are more evidently (though only very slightly) sub-pubescent and with their striæ proportionably broader and deeper, and its funiculus-joints are altogether somewhat shorter and more compact. From the Madeiran *M. Euphorbiæ* it may be known, *inter alia*, by its darker hue, more laterally-rounded prothorax (which has its hinder central punctures much more coarse), by its larger frontal fovea, and by its elytral striæ being very much broader, deeper, and more distinctly crenated.

§ II. *Corpus minus, sub-fusiforme (elytris postice sensim acuminatis); femoribus masculis subtus obtuse sub-dentatis.*

39. *Mesites fusiformis*, n. sp. (Pl. 19, figs. 7, 9.)

M. nigro-piceus, nitidus, depressus, fere calvus; fronte inter oculos profunde foveolatâ; prothorace in disco levissime et parce punctulato, sat obscure carinato necnon postice in medio impresso et ibidem profunde sub-biseriatim punctato; elytris plus minus rufescentioribus, profunde punctato-striatis, interstitiis planiusculis, minutissime et parce punctulatis; antennis pedibusque rufescentioribus.

Mas.—Rostro punctulato, ad antennarum insertionem paulo rotundato-ampliato; prothorace versus latera vix profundius densiusque (quam in disco) punctato.

Fœm.—Rostro graciliore, tereti, polito, rufo-piceo, ad antennarum insertionem (i. e. mox ante basin ipsam) paulo ampliato; prothorace versus latera multo profundius densiusque (quam in disco) punctato.

Long. corp. lin. $1\frac{1}{3}$—3.

Habitat insulas Canarienses, ramos Euphorbiarum emortuos ubique destruens.

The present *Mesites* and the *M. pubipennis* may be at once known from those already enumerated by their sub-fusiform outline (their elytra being more or less perceptibly attenuated posteriorly), and by their male-femora being obtusely *sub*-dentate beneath; whilst *inter se* they will be recognised by the *M. fusiformis* being (like the five preceding species) free from any trace of the lurid pubescence which is so conspicuous in the Palman representative. The *M. fusiformis* is, likewise, less deeply sculptured than the *pubipennis;* and its elytral interstices are less

convex, and more sparingly (and even more minutely) punctulated. Although confined to the rotten stems of the various Euphorbias of the Canary Islands, the present insect and the following one are essentially distinct from the *M. Euphorbiæ* of Madeira; for not only do they differ in the *sectional* characters already pointed out, but (in addition to numerous other differential features) their elytra are much more coarsely striated (the striæ, moreover, being *punctate* instead of crenate), their surface is more shining and of a darker hue (the head and prothorax, and sometimes even the elytra likewise, of the Canarian species being almost or entirely black); their forehead is more deeply foveolated, their prothorax is impressed with a few additional larger punctures in the centre behind, their elytral interstices are less rugulose, and the antennæ of their female sex are implanted rather further from the extreme base of the rostrum.

The *M. fusiformis* is most abundant throughout the Canarian group—Palma being the only one of the seven islands in which, up to the present date, I have not taken it. Being thus universal, however, there can be but little doubt that it must exist in Palma likewise; and the fact of my sojourn there, in May and June of 1858, being somewhat late in the season for the *Euphorbia* insects, may perhaps be a sufficient explanation for its having escaped me in that island. Nevertheless it is certainly remarkable that the few specimens of the genus *Mesites* which I happened to secure whilst at Palma from the dead stems of the Euphorbias should have been specifically distinct from those which obtain in similar positions throughout the remainder of the archipelago. Nor is this rendered the less curious from the circumstance, that the large *M. persimilis*, which infests the laurel-woods of Teneriffe, should be, also, represented in the sylvan districts of Palma by an allied but most conspicuous species, the *M. complanatus!* The *M. fusiformis* was first captured by myself and Mr. Gray, during January, 1858, out of the rotten *Euphorbia*-stalks in the north of Lanzarote; since which period I have, as just stated, found it in all the Canarian islands except Palma. It swarms in the various Euphorbias (though less, perhaps, in the *E. canariensis* than in the others), and occurs throughout the whole *Euphorbia* regions, independent of elevation.

40. *Mesites pubipennis*, n. sp.

M. nigro-piceus, nitidus, depressus, breviter lurido-pubescens; fronte inter oculos profunde foveolatâ; prothorace in disco leviter et parce punctulato, obscure carinato necnon postice

in medio impresso et ibidem profunde sub-biseriatim punctato ; elytris plus minus rufescentioribus, densius pubescentibus, valde profunde punctato-striatis, interstitiis convexis, minute punctulatis ; antennis pedibusque rufescentioribus.

Mas.—Rostro punctulato, ad antennarum insertionem paulo rotundato-ampliato ; prothorace versus latera paulo profundius densiusque (quam in disco) punctato.

Fœm.—Rostro graciliore, tereti, polito, rufo-piceo, ad antennarum insertionem (i. e. mox ante basin ipsam) paulo ampliato ; prothorace (præsertim versus latera) multo profundius densiusque (quam in disco) punctato.

Long. corp. lin. $1\frac{2}{3}$—$2\frac{1}{2}$.

Habitat ins. Palmam, in ramis emortuis *Euphorbiæ piscatoriæ*: Maio exeunte A. D. 1858 a meipso captus.

The distinctions between the present species and the last one have already been pointed out—the pubescent elytra of the *M. pubipennis* (which have their interstices more convex and evidently punctulated, and their striæ broader and deeper), in conjunction with its more closely and roughly punctured prothorax (especially, however, of the female sex), being quite sufficient at once to characterize it.

As just stated, the *M. pubipennis* is apparently peculiar to Palma, where I took eight specimens of it from out of the decayed stems of the *Euphorbia piscatoria*, in the Barranco, above Santa Cruz, at the end of May, 1858. That it is no modification of the *M. fusiformis*, which is so abundant and universal throughout the other islands of the Canarian Archipelago, seems evident from the fact that that insect remains constant under the various circumstances and conditions, and in the innumerable localities, in which it is elsewhere found—being, to all appearance, quite independent both of external agencies and altitude. I conclude, therefore, that the very decided characters of sculpture and clothing which distinguish the *M. pubipennis* are truly specific ones, and such as cannot be referred to local influences of any kind.

XXVI. *Descriptions of Five New Species of* Coleophora. By John Scott, Esq.

[Read Aug. 6th, 1860.]

Coleophora Melilotella. (Pl. 17, fig. 1.)

Antennis supra articulum basalem per squamas orichalceas manifestè incrassatis, ceterum fuscis apice albo; alis anticis orichalceis, nitidis, apice saturatè cupreo, ciliis violaceis.

Exp. alar. 7—9‴.

Male.—Palpi, face, head and thorax bright green bronze. Antennæ fuscous, with a few of the terminal joints white. The basal joint *perceptibly* thickened. This, with the two following, is covered with bronzy-green scales. Anterior wings extremely bright and shining green-bronze, the apex broadly coppery, the latter colour extending also for an indefinite length along the costal edge. Posterior wings and cilia (of both pairs) inclining to violaceous.

Female.—Palpi, face, head and thorax bronzy-green. Antennæ dark bronze for about two-thirds of their length, the terminal third white. Basal joint thickened, and this, as well as the two following, are covered with brilliant violaceous-red bronze scales. Anterior wings golden bronze, tip broadly of a ruby copper, which colour also extends for some way along the costal edge. In some examples the entire outer edge is of this colour. Cilia violet grey. Posterior wings violaceous, inclining to *bronzy-green at the tips;* cilia as in the anterior wings. Abdomen in both sexes of a bronzy-green, that of the ♀ partaking of a silvery hue. All the legs are also clothed with bronzy-green scales.

This insect on first sight bears a great resemblance to *Frischella.* It is fully as large as that species and certainly as brilliant, but the wings are somewhat narrower and the colour has more of a silvery greenness about it, which will enable any one to separate it from *Frischella.* The perfect insect makes its appearance about the middle of July.

In August last year I met with the larva of this species feeding on the seeds of *Melilotus officinalis.* In its young state the larva hollows out a single seed, which it attaches to the apex of a second one, upon which it commences its operations, and after having mined this also, it travels away with the two emptied

seeds, and attaches the end of one of these to the apex of a third seed. The case at this time has somewhat the appearance of three diamond-shaped beads strung together. After a little time, however, all the irregularities disappear, and the case becomes nearly cylindrical, slightly narrowed at the mouth, while the apex is drawn into the shape of an equilateral triangle, generally paler than the other portion of the case, which is a dirty-brown colour.

Coleophora Artemisiella. (Pl. 17, fig. 2.)

Antennis albis fusco-annulatis, articulo basali incrassato; alis anticis albidis lineis quatuor griseo-ochreis, prima levis apicem versus distinctior, secunda in apice cum prima, tertiaque recta in apice cum secunda junctis, quarta lata ex basi in margine postica extensa et in tertia currente.

Exp. alar. 5‴.

Head, face and palpi white; antennæ white, annulated with fuscous, the basal joint thickened, white; anterior wings white, with four drab-coloured longitudinal streaks, all rising from the base of the wing. The three upper ones are all united at and for some distance from the base, the one next the costal edge being the most slender, and almost obliterated before reaching the costal angle, when it suddenly becomes of a deeper colour, extends into the cilia, and at this point it is met, at an acute angle, by the extremity of the second streak. The middle (or second streak of the three) seems always inclined to branch off towards the costal edge, and about the middle of the wing a short streak is put forth; beyond this it is much broader, and joins, as stated above, the first streak at an acute angle. The lowest of the three streaks runs straight out to the dorsal edge, along which it goes until it joins the second streak abruptly at the anal angle. The fourth streak is broadest at the base of the wing; it also runs out to and along the dorsal edge until it joins the third. The white space between this and the third streak is very distinct. Cilia grey, with somewhat of a violet tinge. Posterior wings lead-coloured, faintly inclined to purple. Cilia as in the anterior pair. Legs white, tarsi of the posterior pair pale fuscous underneath. Underside of the anterior wings lead-coloured, with a slight shade of purple. Cilia along the costal edge greyish-white. Posterior pair lead-coloured, also with a purplish gloss. Cilia greyish.

The insect is very abundant, in the larva state, at Middlesbro', and may be found from the end of August to late in September. The perfect insect is one of those dingy-looking species which

might be easily overlooked. It is nearly allied to *C. Murinipennella*, *argentula* and *albicans*, but the first streak next the costal edge, running into the cilia, and the second and broadest streak of the four, not branching out as in the above species, will at once render it easy of separation from them.

The larva feeds on *Artemisia maritima*, in a grey and somewhat cylindrical case.

Coleophora Ardeæpennella. (Pl. 17, fig. 3.)

Antennis albis angustè fusco-annulatis, basi alba, penicillo brevi apice fusco; alis anticis albis costa ciliisque nigris.

Exp. alar. 5—6‴.

Palpi, face, head and thorax pure pearly-white. Antennæ white, narrowly annulated with pale fuscous, the basal joint having a short white tuft, the extreme tip of which is pale fuscous. Anterior wings white, with a few *black* scales at the costal angle; the costal edge from where the cilia rise, as well as the cilia themselves, are also black, the remaining cilia fuscous. Posterior wings dark grey; cilia the same. Legs and tarsi white, the hinder tarsi annulated with fuscous. Underside of the anterior wings blackish-fuscous, and without the whitish blotch in the cilia as in *Ibipennella*.

The larva lives in a short pistol-shaped black case, which stands *almost perpendicular* to the leaf. It is somewhat after the shape of *Anatipennella*, but is not half its size, and is flatter on the sides than in that species. It also somewhat resembles the case of *Ibipennella*, but the different position of the mouth, as well as the deeper blackness of this last-named species, readily distinguish it from *Ardeæpennella*. The larva is full fed at the end of June or beginning of July, and has hitherto been found only on oaks. The perfect insect appears towards the end of July, and might easily be passed by as *Ibipennella*, but the few *black* scales at the costal angle, as well as the black cilia and costal edge from which these rise, readily distinguish it from *Ibipennella*. It is an abundant species in the larva state both in Dulwich and Darenth Woods.

Coleophora politella. (Pl. 17, fig. 4.)

Antennis albis, articulo basali brunneo vix incrassato, ceterum albis fusco-annulatis; alis anticis sub-angustis, apice læte recurvo, aureo-brunneis, nitidis; ciliis aureo-brunneis, in dorso purpurascentibus.

Exp. alar. 5—5½‴.

Palpi, face, head and thorax shining golden brown. Antennæ white, annulated with fuscous; the basal joint, scarcely thickened, is, with the next, golden-brown. Anterior wings shining golden-brown, *rather narrow and slightly falcate at the tips.* Cilia (costal) shining golden-brown, extending to the anal angle; the remainder purplish, mixed with golden brown. Posterior wings bronze-coloured, with greyish-brown cilia. All the legs and underside of the abdomen of a shining pale golden-brown colour, having a silvery lustre. Underside of all the wings purplish-fuscous; the tips of the anterior pair golden-brown. Cilia of the anterior pair golden-brown at the anal angle and along the costa; the remainder, as well as those of the posterior pair, purplish-brown.

This insect is allied to and very much resembles *C. fuscedinella*, but the wings are much narrower than in that species, and are besides falcate at the tips. These characters will enable any one to separate it from *fuscedinella*.

The larva lives in a singularly stumpy case, reminding one of a miniature *Viminetella*, but it is rather stouter and only about one-half its length. The specimens from which my description has been made were bred from cases found by Mr. Eedles on nut-trees. The perfect insect appears in July.

Coleophora Wilkinsoni.

Antennis distinctè fusco et albido annulatis, apice albo articulo basali incrassato, nitidulo; alis anticis fusco-murinis, nitidis.

Exp. alar. 5—7‴.

Head and face mouse-coloured grey, metallic. Palpi white. Antennæ distinctly annulated with fuscous and white to beyond the middle, the remaining portion white; basal joint of the antennæ thickened, mouse-coloured grey. Anterior wings mouse-coloured grey, shining. Posterior wings the same. Cilia of all the wings unicolorous. Hinder legs silvery white.

This insect belongs to the *siccifolia* group of the genus, in which the perfect insects assume more or less a lead-coloured appearance, so that when they are captured, and not bred, so great is their similarity to each other that the most experienced eye has a difficulty in distinguishing them. The insect which I have described as *Coleophora Wilkinsoni* is nearly allied to *siccifolia*, but may be distinguished from that species by the annulations on the antennæ being only continued for about half their length, whereas in *siccifolia* the annulation is carried throughout. Again, in *sicci-*

folia two or three of the basal joints seem to diminish in thickness until they arrive at a uniformity. In *Wilkinsoni* the basal joint alone is thickened, all the others being of an uniform thickness. Nor do the antennæ appear to be so long in the present species as are those of *siccifolia*. The hinder legs have a silvery-white appearance, and when the light falls upon the tarsi in certain directions they appear annulated.

The larva mines the birch-leaves in August and September. The case appears to be made of a portion of the leaf of the food plant, and is of a dark brown colour, growing deeper, through various atmospheric causes, after the larva has retired to complete its transformation. The case somewhat resembles those of *Viminetella* and *politella*, but it is longer than the latter and not so long as the former, neither is it bicolored as in these two species. A great character in the formation of the case of *Wilkinsoni* is a rounded projection towards the middle, on its underside, of a greater or lesser size, the lower edge of which is parallel with the mouth of the case, and rests upon the leaf both while the larva is feeding and in a state of repose. This insect cannot be confounded with the birch-feeding species for which the name of *betulifolia* (Ent. Annual, 1858, p. 115) was proposed, because in the Ent. Annual, 1857, p. 134, this species is described with a case similar to *siccifolia*.

I have named the insect after Mr. Thomas Wilkinson, of Scarborough, who has bred it now for four years, and who was the first to call my attention to its peculiarities.

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON,

1858—1859.

February 11, 1858.

F. Smith, Esq., in the Chair.

The Secretary read a letter from the President of the Society, Dr. J. E. Gray (who was unavoidably absent), in which he nominated as Vice-Presidents for the year W. W. Saunders, Esq., J. O. Westwood, Esq., and F. Smith, Esq.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Transactions of the Linnean Society,' Vol. xxii., Part 2; presented by the Society. 'Mémoires d'Entomologie publiés par la Société Entomologique des Pays-Bas,' Livraisons 1, 2 & 3; by the Society. 'Exotic Butterflies,' Part 25; by W. W. Saunders, Esq. 'Genera des Coléoptères,' Tome iv.; by the Author, Prof. Lacordaire. 'Proceedings of the Royal Society,' Vol. ix., No. 28; by the Society. 'The Literary Gazette' for January; by the Editor. 'The Journal of the Society of Arts' for January; by the Editor. 'Biographical Notice of the late Professor Carlo Passerini.' 'The Zoologist' for February; by the Editor. 'Description de Longicornes Nouveaux du vieux Calabar,' par M. A. Chevrolat; by the Author. 'Linnæa Entomologica,' Zwölfte Band; by the Entomological Society of Stettin.

Election of a Member.

R. B. Were, Esq., 35, Osborne Terrace, Clapham Road (formerly a Subscriber to the Society), was balloted for and elected a Member.

Exhibitions.

Mr. Stevens exhibited some Lepidoptera and Coleoptera sent from Port Natal by M. Gueinzius: amongst the former were specimens of Charaxes Zoolina, Salamis Cloantha, and some beautiful species of Bombycidæ; also an Adela closely resembling the A. Degeerella of Europe: the Coleoptera included Hypselogenia geotrupina, Sternetornus Bohemanni, Eunostus Gueinzii, and eight species of Paussus.

Mr. Stevens observed that Eunostus Gueinzii was stated by M. Gueinzius to be nocturnal in its habits, and this appeared to be generally the case with pale-coloured insects: the pale Megacephala taken by Mr. Bates on the Amazon was said by him to be a strictly nocturnal species.

Mr. Smith observed, in corroboration of this theory, that the pale-coloured Vespa Doryloides, *Sauss.*, lately sent home by Mr. Wallace from Borneo, was said to be found at night only, which was the more interesting as no other species of wasp was yet known to be nocturnal.

The following notes, which accompanied the collection exhibited by Mr. Stevens, were communicated by M. Gueinzius:—

On the Habits of Paussidæ, &c.

"Except the specimens of Paussidæ which have been attracted by candle-light, I have never found a specimen elsewhere than in ants' nests, except one, and that a new species, in this collection, which I found in the hot sunshine, sitting upon a blade of grass, no doubt quite accidentally. They all live with species of ants which are carnivorous: Cerapterus, Pleuropterus and Pentaplatarthrus with different larger species, but the true Paussi seem to live only with our small species; at least I have found P. cucullatus, P. Dohrnii, P. Latreillii, P. Shuckardii, and three other species in the collection, all with one and the same species.

"One night last summer I heard a slight tap on a window-pane, as from a grain of gravel: upon going out with the candle I found it was a Paussus (similar to Dohrnii), of which I had not seen a specimen for some years: not half an hour afterwards I heard the same sound on the same window, and found a second specimen. Although I did not observe the sex, there is little doubt that the first specimen was a female, and the second a male. In a number of instances I have observed that the females of Coleoptera move some time before the males. I observed one morning a female Eudicella Smithii settle on a branch of a shrub before my door; not half an hour after I had removed it a male had settled on the very same spot. An enormous female Sternotornis niveisparsa (attracted by the candle) will strike the window so as nearly to break the pane, when some time after the smaller-sized male will arrive at the same window. In the same way, and under the same circumstances, I have obtained two rare species of smaller Scarites, always in pairs; and so it appears that these beetles are able to trace the flight of the opposite sex through the air, a good while after it has passed. Paussi appear in the month of November, and last during the whole season until April: their caustic juice is squirted out of the sides of the abdomen; part of it evaporates immediately as a blue smoke, distinctly visible by sunlight; the remainder covers both sides of the elytra, and remains as a whitish or pale yellow unctuous matter. I have repeatedly found P. Latreillii in the act of copulation in ants' nests. The specimens are nearly always found in the part of the nest where the eggs and pupæ are deposited; and although I have never yet observed a Paussus in the act of feeding, yet, from the great and mysterious attachment which the ants show them, I am inclined to believe that they feed upon the spoil which the ants convey into the nests, rather than upon their eggs or pupæ: I believe, likewise, that the eggs of the Paussi are there deposited and bred, and it is not impossible that their larvæ are fed by the ants as their own offspring. The sunny sides of the margins of forests are the places where Paussi are generally met with; a piece of old dry wood is

seldom found without an ants' nest beneath it (stones get too hot in the sun): when the weather is very dry they remain below ground, but when moist they ascend and carry their eggs and pupæ to the surface under the wood: when this shelter is carefully lifted up on one side, I have often observed a Paussus (P. Dohrnii, cucullatus or Latreillii), surrounded and covered with ants, apparently sucking nourishment out of him, and fondling him all the time with their antennæ, as they do the Aphides and larvæ of Centroti, and other lamellicorn Coleoptera found with ants.

"When the alarm is given in a nest, and all is hurry and bustle to save eggs and pupæ, two or three ants will seize the sluggish Paussus by the antennæ, and he is quickly hurried below with the rest. I can discern no difference in the odour emitted by P. cucullatus and P. Latreillii, when exploding, and that which is perceived on opening an ants' nest on a hot day."

Captain Cox exhibited some diagrams illustrating the economy of Scolytus destructor, and read the following communication, pursuant to notice given at the last Meeting:—

On the Ravages of Scolytus destructor.

"Ten years have nearly elapsed since the Royal Botanic Society of London awarded me their medal, and had my Paper (read before the Society in 1848) published for distribution among the Fellows and Members. Mr. R. Marnock (the Curator) then stated 'that the results of the operations recommended in that Paper had been most satisfactory, and had proved highly beneficial to the trees.' As I feel certain that I shall nearly stand alone in the views I have taken of the habits of the Scolytus destructor, it is most essential that I should avail myself of the powerful testimony of the award made by the Royal Botanic Society of London, and of the report of the Curator, to assist me in bringing conclusive evidence before you that we are now perfectly acquainted with the true habits of the Scolytus destructor, and the means of arresting its future progress; it is most peculiarly fitting now that Science should step in and prove that over one pest at least we have power, and if not made use of the fault lies entirely with the public.

"Among the various pests that are constantly claiming attention by their obnoxious powers, the Scolytus destructor holds no mean rank: the elm is one of the most useful trees we have in this country; it suits our climate, is extremely ornamental and flourishes where others would not thrive so well, its timber is made use of in various ways, and therefore its preservation is alike advantageous to our ornamental parks and woodland scenery. Previous to 1840 the Scolytus destructor was known, but its habits not perfectly understood: it was during the formation of the Royal Botanic Gardens that my attention was first directed to the sickly state of the elms forming the belt of the inner circle of the Regent's Park; the axe was constantly being applied, and large and increasing gaps pointed to where the trees had stood and where destruction was going on: on enquiring of the parties laying out the grounds as to the cause of the premature decay of these fine young trees, I was informed that 'some had perished by having an inner embankment formed to prevent parties outside the garden from looking over, and consequently a portion of earth had been raised round their stems, and that others had died, and were dying from their roots entering the gravel.' Now, if this latter information were true, I could not understand why the circle of trees, separated by only a few yards from them, and

forming the next circle, were healthy, all being of the same age. In all cases where the destruction was going on I found the Scolytus in great profusion: on mentioning this circumstance to the Curator, the old stereotyped answer came in due form, 'that this beetle always attacked sickly and deceased elms, and were since to be found in all places where this timber had fallen or had been conveyed, either decaying along the road-side or drawn into the timber-yard.' Now, in the first place, I was not satisfied in my own mind that the trees were perishing from the assigned causes; the coincidence was too remarkable not to be noticed, and I felt sure that there was something more than the embanking and gravel to account for the rapid death of so many young trees in different parts of the belt, more especially as my attention had been called, in 1842, to the state of the trees in St. James' Park; with a very little reflection I felt convinced that insects had something at least to do with the matter, and that among them, if the Scolytus destructor were not the first and absolute cause, their presence acted most injuriously by still more disabling the already impeded circulation of the sap: being fully impressed, after further close and most attentive examination into the subject, of their powerful influence, I made it my business to study their habits, and soon became so far master of them that I was induced, in 1843, to read a paper upon the subject before the Royal Botanic Society, and detailed a mode of treatment I felt almost certain would succeed: as the trees in the park belong to Her Majesty's Woods and Forests, the Council of the Society applied for permission to allow me to experiment upon some, and a row of eighteen, fairly selected, were placed at my disposal.

"The following eighteen trees were granted by the Commissioners of Woods and Forests in 1843:—

No.	Scolytus.	Cossus.	Condition—1843.	Condition—1847.	Condition—1849.
1	„ *	0	Slightly.	Nearly recovered.	Recovered.
2	„	„	Most severely, dying.	Dead.	Dead, removed.
3	„	„	Most severely.	Nearly recovered.	Recovered.
4	0	„	Slightly.	Recovered.	Do.
5	„	0	Do.	Do.	Do.
6	„	0	Do.	Do.	Do.
7	„	„	Severely.	Do.	Do.
8	„	„	Slightly.	Do.	Do.
9	„	„	Most severely.	Nearly recovered.	Do.
10	0	„	Slightly.	Recovered.	Do.
11	„	„	Very severely.	Do.	Do.
12	0	„	Slightly.	Do.	Do.
13	„	„	Very severely.	Do.	Do.
14	0	„	Slightly.	Do.	Do.
15	„	„	Most severely.	Nearly recovered.	Do.
16	0	„	Do.	Do.	Do.
17	„	„	Slightly.	Do.	Do.
18	0	„	Most severely	Do.	Do.

* The presence of either Scolytus destructor or Cossus larvæ is indicated by „ according to the heading of the column in which they appear.

"From this table the condition of the trees will be seen previous to being submitted to my plan. Now, before we proceed to speak of treatment, there are two very important stages to be settled: first, is the tree diseased before it is attacked by the Scolytus? and, in the second place, does the attack of the Scolytus prove injurious to the tree?

"As regards the condition of the tree, I think we had in the Garden of the Royal Botanic Society a sufficient number of sickly ones to enable us to come to a very fair conclusion. The number first planted was 242; in 1843, 67 had a healthy appearance; 66 were attacked by the Scolytus, 10 by the larvæ of Cossus Ligniperda; 99 had sickened or died, and had been cut down, 62 of which sprouted again, and 37 quite perished. With respect to the condition of the healthy ones, the embankment equally adjoined them in places; but of the 18 that were allotted to me no embankment existed; therefore this could not have been the cause of Nos. 2, 3, 7, 9, 11, 13, 15, 16 and 18 having such a sickly appearance; and if it arose from their roots penetrating a gravelly soil, the mere fact of partially barking could by no possibility restore them to health and vigour. I think we may fairly say that this is a self-evident proposition. And, again, what is the appearance of a tree languishing from defective soil? We see it first in the leaf, which is small and unhealthy in colour; the terminal branches next gradually decay, piece after piece breaking away, until the longer branches present what is generally called a 'stag-horned appearance,' and the tree finally perishes; but this is not brought about in a day or a week, being usually the affair of some few years, for as long as nutriment can be obtained the crippled tree exists in its withering and fading condition. But when we find a tree dead, with terminal branches profuse and perfect, we certainly, under ordinary circumstances, should not say that tree had died from defective nutrition in the soil, but that, from some cause or another, it had suddenly, as it were, come to an untimely end; and such a tree we had in the Gardens; I watched it in its beauty, and in three years saw it cut down and carried away dead; but what a sight met our view on removing the bark!—the surface of the trunk, as many gentlemen will remember (for I exhibited a piece of it, 3 feet long, before this Society), was beautifully scored by the lateral tubes of the Scolytus larvæ; and we reckoned that this solitary tree gave birth to no less than the prodigious number of 280,000 perfect insects! Well may we be transfixed with astonishment; but the greater wonder is that an elm should still be found to grace our ornamental parks. I may now fairly presume to state that the 18 sickly trees were not in the least suffering from defective nourishment at the roots, nor had their stems been embanked in soil; and yet many of them were evidently dying; but one thing was very apparent, namely, that in proportion to the sickly condition of the tree so we found the increase of Scolyti. And this leads us to the second question,—Does the attack of the Scolytus prove injurious to the tree?

"The Scolytus destructor is known to many present; it is a small dark beetle, belonging to the family Bostricidæ of Leach. When the first warmth of spring sets in the perfect insect escapes from beneath the bark, by eating its way out; the female soon after selects a tree for the purpose of depositing her ova; she commences her perforation always beneath a little projecting piece of bark at the upper end of a crack; she bores inwards and upwards until on the surface of the alburnum, when she ascends direct; the tube thus formed is from 2 to 3½ inches in length, ¾ths of a line in diameter, and of equal size throughout, except at a short distance from its entrance, where a small cavity is usually found sufficiently large to allow the parent insect to turn; on

each side, in small crenules, she deposits her eggs as she advances, and closes the aperture with some plastic material; the number of eggs is in proportion to the length of tube (and this is very much influenced by the condition of the under surface of the bark, for if the Scolyti abound the parent ceases boring, so as not to perforate the workings of another when she approaches it); only a small septum divides each; there are generally from 60 to 70. On bursting their shells the young larvæ immediately commence feeding on the last deposit of alburnum; they at first form parallel transverse lines or tubes, which are seen to gradually enlarge and diverge, and are filled with exuviæ as the larvæ progress onwards; their increasing size now oblige those larvæ first hatched to bore downwards, the centre ones outwards, and the last upwards; here they continue to feed during the summer, autumn and winter (if mild): when full-grown they form a case, in which they change to the pupa state; and then, at the end of May or beginning of June, they eat their way out through the substance of the bark, and leave those shot-like holes showing their plan of exit: they now fly about for a short time, and then the females commence the process for perpetuating their species, by laying their eggs. I believe after they have once commenced boring and depositing their ova they never take wing again: as soon as the female has deposited all her eggs, with her head pointing inwards, she dies at the entrance of her tube, thus, as it were, even in death performing a maternal duty, by closing the aperture to her young ones with her dead body. It is very rare to find a parent tube without the insect, although no doubt they occasionally become a prey to various smaller insects. It is the frass the female ejects from the tube that leads to the detection of the presence of the brood, for were it not for this fortunate circumstance we should never be apprised of the destruction going on within the tree until the escape of the mature insect, in spring, shows the exit-holes.

"I will not trespass more now into detail, but simply state that each family will destroy nearly four square inches of bark. Granting, therefore, even the possibility of the Scolyti being attracted by the sickening state of a tree, here we find one parent insect has the power of destroying a large portion of bark, and consequently must rapidly hasten the final decay. No doubt where the insect abounds it will perforate the bark of fresh-hewed timber; but I have never found one specimen in an elm whose juices were dried up. Therefore, irrespective of the cause of disease, it must be unanimously granted that an insect which can destroy four square inches of bark by detaching it from the alburnum must prove highly destructive, and, whilst permitted to remain, frustrate any attempt to restore health. If, in the absence of any true and logical cause, we have found elm trees sickening and dying, and their bark bearing the unequivocal signs of the Scolyti, and simply by a process of partial barking and removing the Scolyti larvæ, we arrest the decay of those not too far advanced, and in a comparatively short period restore them to health and beauty, we have every rational right to infer that the Scolyti, and the Scolyti alone, were the aggressors in the first instance, and destroyers in the second; and still more, that when we find the whole of the diseased trees in the Royal Botanic Gardens perfectly recovered in 1849, and now (1858) bearing all the impress of vigour, so that in many the fearful scars once made are now hidden from sight, and buried by the overlapping of succeeding yearly deposits, I think this Society will ask no further proofs at my hands of the sound and practical results that have followed the simple and easy process of partial barking; that the lapse of so many years establishes beyond a doubt its great utility; and that, in the absence of any other advanced system for arresting the spread

of the Scolyti in particular, this plan ought to be strongly advocated ere another year sends forth its thousands to still more diminish the number of these noble and beautiful ornaments to our parks and pleasure-grounds.

"The plan I adopt for destroying the insect is very simple: as the frass always indicates the aperture to the tube, and as this always ascends directly upwards, so by paring off the old exuvial bark we lay bare the tube and completely destroy the young brood. I strongly advocate clearing off all the old bark of elms where the Scolyti abound: in the first place, the trees actually seem to improve by the process; in the next place, the Scolyti cannot find the shelter of the overhanging bark, and therefore are more liable to become the prey of birds; and finally, you detect at once the presence of any fresh attack. I believe the process adopted in France, of taking the whole bark off down to the alburnum, is fraught with great risk; it did not succeed in a tree that I saw, nor can I conceive a more unnatural operation. I merely cut the insect out, the tree is scarcely injured by the process, and a few years obliterates all trace of the operation. The instrument I prefer is a simple draw-shave, known to coopers and carpenters; it is very easily used, and answers the purpose admirably: in using it all we have to do is to cut down to the parent tube, and then lay bare the lateral tubes to their end, taking care that no larvæ remain; the healthy alburnum is therefore not injured, 'causa sublata æger verelescit.'"

Mr. S. S. Saunders read a paper intituled "Observations on the Habits of the Dipterous Genus Conops," and exhibited the larva, pupa and imago of a species of that genus, which he had reared from Pompilus audax.

Mr. Westwood read the description of a new genus of Carabideous insects, belonging to the Scaritides, having the outward appearance of the Heteromerous genus Adelostoma (differing from all the known Scaritides in the opaque surface of the body), and remarkable for the two deep oblique canals on the under side of the head, united behind in front of the very small neck, and within which the antennæ are lodged when at rest. The genus is founded on a single species recently sent from the River Amazon by Mr. Bates, to which Mr. Westwood applied the name of Solenogenys fæda.

Part VI. of the current volume of the Society's 'Transactions' was on the table.

March 1, 1858.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'The Journal of the Royal Agricultural Society of England,' Vol. xviii. Part 2; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. ii. No. 7; by the Society. 'The Natural History Review,' Vol. v. No. 1; by the Dublin University Zoological Association. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part xiii. Noctuidæ; by the Author, Francis Walker, Esq., F.L.S. 'The Zoologist' for March; by the Editor. 'The Journal of the Society of Arts' for February; by the Editor. 'The

Literary Gazette' for February; by the Editor. 'The Athenæum' for January; by the Editor. 'The Entomologist's Weekly Intelligencer,' Nos. 67 to 74; by H. T. Stainton, Esq.

Exhibitions.

Mr. Smith exhibited a box of insects sent him by Mr. Foxcroft, by whom they were captured in the Free Town Garden and suburbs of Sierra Leone, in December last. The Lepidoptera included Papilio Hippocoon and P. Pylades, a fine Charaxes, apparently the female of C. Brutus, and both sexes of Euchromia instructa. Amongst the Coleoptera were Tetralobus flabellicornis, Sternotomis mirabilis and S. regalis, Prosopocera bipunctata and Dirphya, n. s.

Mr. Smith also exhibited a Coleopterous insect allied to the genus Myrmedonia, which he had found amongst a number of specimens of the driver ant (*Anomma Burmeisteri*), sent from Sierra Leone with the before-mentioned collection.

Mr. Stevens exhibited some beautiful Lepidoptera and Coleoptera, taken by Mr. Wallace in Ke and Aru Islands, near New Guinea, of which the most remarkable were the sexes of a variety of Ornithoptera Priamus, and the pupa-case from which a female specimen had been bred, Papilio Enchenor, P. Ormenus, P. Ambrax, Hestia D'Urvillii, some fine species of Drusilla and beautiful Erycinidæ, mostly hitherto unknown, Cocytia D'Urvillii, and some singular Geometræ, &c. The Coleoptera included three handsome species of Eupholus, a gigantic new Mecocerus, several brilliant Buprestidæ, some fine and new Lomopteræ, numerous species of the Papuan genus Tmesisternus, and a noble Batocera, very distinct from all the known species of the genus.

Mr. Smith exhibited some Hymenoptera captured by Mr. Wallace in the Aru Islands; amongst the more remarkable were a species of Zuthus, entirely of a fine brassy green colour, a new and beautiful species of Tremex, several very beautiful Pompili, and numerous Formicidæ; amongst the latter the finest species of Myrmica perhaps hitherto discovered; three species of Odontomachus, and some entirely new forms of the genus Polyrhachis.

Mr. Westwood observed that it was extremely interesting to see the fine Papilios, &c., which had been found seventy years ago by the Dutch in the Islands of the Indian Archipelago, and since almost forgotten, were now being re-discovered and sent to this country in such admirable preservation: the best thanks of entomologists were due to Mr. Wallace and those who, like him, hazarded their lives in unhealthy tropical climates to collect objects of Natural History, and he trusted they would receive the pecuniary reward they so well merited.

Mr. Westwood exhibited a Tortrix of the genus Carpocapsa, allied to C. splendana of Europe, which had been bred by Mrs. Wood, of St. Leonards, from one of the "jumping seeds" sent from Mexico by Mr. Lettsom, and exhibited at the Meeting of the Society in October last: he observed that, according to a long statement on the subject which had appeared in the 'Journal des Debats,' some of these seeds had lately been received at the Jardin des Plantes in Paris, where the larva had been pronounced to be Coleopterous; but the specimen exhibited proved the correctness of the opinion entertained by entomologists in this country, that they belonged to a Lepidopterous insect. The question as to the mode in which the inclosed larvæ are able to execute the jerking movements exhibited by the seeds remained still an interesting question, for, supposing they were caused by the caterpillar adopting a process similar to that employed by the cheese-hopper, it must be regarded as a solitary instance of such action amongst lepidopterous larvæ.

Mr. Westwood also exhibited the larva of Drilus flavescens, which had been sought for in vain in snail-shells during the excursions of the Society at Reigate, where the males were not uncommon. He had received the larva from a correspondent who had found it in a snail-shell, and it agreed with the figures which had been published in France, where its transformations had attracted considerable attention some years ago, and where the female had been described as a distinct genus, under the name of Cochlevetonus.

Dr. Gray observed that this larva was known to Petiver one hundred years ago.

Mr. S. S. Saunders exhibited two specimens of Leptoderus Hohewartii (Stagobius troglodytes, *Schiodte*, Trans. Ent. Soc., N. S., v. 1, pl. 9, figs. 1, 1 a), one of the blind beetles from the Proteus Cave at Adelsberg, in South Austria. The species, which pertains to the Silphadæ (although the extraordinary elongation of the antennæ and legs give it an appearance quite dissimilar to that of any other genus in the family), was found by Mr. Saunders on a large Stalactite in the deepest part of the cave.

Mr. Smith exhibited some Hymenoptera and their nests, sent from Port Natal by M. Gueinzius, and read the following note communicated by him:—

On the Habits of the Hymenoptera of Natal.

"A species of Stilbum lays its eggs on the collected caterpillars stored up by Eumenes tinctor, which constructs a nest of mud and attaches it to reeds, &c., not in single cells, but a large mass, in which cells are excavated, similar to the nest of Chalicodoma muraria. How does the fly, with such an apparently weak instrument, penetrate such a structure? First, it uses it as a gimlet, and when its point has a little penetrated, then as a saw or rasp: it likewise feels with its ovipositor, and, finding an unfinished or an empty cell, it withdraws it immediately, without laying an egg. A great number of insects breed annually in my house, for which purpose I have always a door or window open to give them free ingress and egress. I once observed a wasp (Synagris calida), flying about my door; I attempted to catch it, when it flew off, but I observed that it returned again and again; at length I noticed some fresh clay stuck on the door, indicating an intention of building: I was anxious to observe its movements and to reconcile it to my standing the door quite back, inwards; this I effected by partly closing it and then watching the return of the insect with its clay; when it was settled, and was eagerly engaged, I moved the door slowly and carefully, and thus by degrees, in the course of two days, I had the satisfaction to see the Synagris during its building operations: it soon became accustomed to the closest observation, and took no notice of me. One day the Synagris, having finished a cell, and not having time to commence a new one, had to perch on the exposed nest during the night; the light of my candle, however, attracted it, and it flew into the room, and took shelter behind a window-curtain until the morning. This insect collects the larvæ of Catocala and other Noctuidæ which secrete themselves in the fissures of tree-bark, between seed-vessels or contracted leaves. I once observed this Synagris sitting on the leaves of a fine Zinnia elegans; it wandered about as a pointer dog would do, inserting its long maxillæ here and there, and getting more and more excited every moment; at length it began to buzz loudly, and struggling it drew forth at last a hidden caterpillar from the middle of one of the flowers of the Zinnia. No tiger could have been more furious over its prey: with what fury it ran its sting into the abdomen of its helpless victim again and again, and with what a buzz of savage glee it dragged it about from leaf to leaf! at length, striding over it, the caterpillar

lay motionless, but the suckers of its feet stuck fast, the wasp then had to stop to loosen them; this it did very cleverly by curving its abdomen like a hook under the belly of the caterpillar, using its point like a lever; the stoppages occurred so frequently that the wasp got tired of them, so, turning the caterpillar on its back, all further obstruction was avoided.

"Large spiders and caterpillars become immediately motionless on being stung, and I cannot help thinking that the poisonous acid of Hymenoptera has an antiseptic and preserving property; for caterpillars and locusts retain their colours weeks after being stung, and this, too, in a moist situation under a burning sun.

"*Anthidium cordatum.* This insect forms its cells of vegetable down, glued together with a balsam or resin, which it procures from a flower which exudes a brown balsam; with this it glues the hair together. I have frequently seen the Anthidium in the middle of the flowers, and have no doubt this is the plant which supplies the materials for its nest. I think the plant belongs to the Euphorbiaceæ; it is described by Thunberg in 'Flora Capensis.'

"*Pelopæus chalybeus.* A number of this insect annually make their nests under my verandah; these they construct in the hollow tubes of the bamboo. Having stored up a number of spiders, they resort to the forest, where I have seen them scrape the white birds' dung off the leaves of plants; this they moisten with saliva into a pulp, shape it into a lump, and carry it off. With this material they construct the divisions between the cells.

"*Anthophora* ———? This bee infests the walls of my house inside and out; there is not a single hollow or hole that is not tenanted by one of these industrious, tame and stingless little bees. The hotter the weather becomes the harder they work. They appear twice in the season, November and February. When prevented from going abroad they are not idle, but busy themselves in enlarging and cleaning out their nests; this I have frequently heard them doing in the middle of the night. This bee has a parasite; it is a Crocisa; it inserts its antennæ into the cells to ascertain if there is a store of pollen collected; if it finds the owner at home it tries to squeeze past it; if the passage is too narrow it lays hold of the poor bee, and pulls him out of his own door; the bee, without taking any notice of the intruder, flies away after its own business. This Crocisa has the same habit as many other species of Apidæ, namely, that when at rest it does not sit down, but lays hold with its mandibles of the outermost points of a twig or shrub, keeping its body out in a horizontal position. A number of species, probably all males, may be found every evening, occupying similar situations, attached to twigs, blades of grass, &c. It is a strange sight to see a grass or shrub bearing a number of gray, brown or black hairy bees in the place of seeds or flowers.

"The large (Sphex) Pompilus preys upon a very large hairy spider, which lives in thatched roofs, under verandahs, &c. I have seen this spider fly in the greatest terror from the Sphex, who, however, soon overtook him; the spider kept his enemy at a distance with his long legs for some time, until, exhausted at last, it drew its legs close to its body and remained motionless; the Sphex, like a tiger, was soon upon him, and, thrusting his sting into his thorax, soon rendered him motionless; the Sphex then, walking backwards, dragged his victim out of doors.

"I have noticed two large species of Xylocopa; the first black, with a ferruginous thorax, the male of which closely resembles the female; the second black, with long white hairs on the margin of the abdomen; both excavate dead branches, posts,

&c. The male of the latter species I have reason to believe is a large yellow one. Two years ago I broke a hollow fence post, in which I found a species of Xylocopa; the females were black, the males of a pale fulvous colour. This species was of a smaller size."

Mr. S. Stevens exhibited an entomological store-box lined with Croggon's patent felt, instead of cork, for which, he observed, it appeared to be a tolerably good and very cheap substitute.

Mr. Stevens announced that Mr. Shield proposed to visit Bahia or Paraguay, in search of insects and other objects of Natural History, and was anxious to obtain subscribers to enable him to do so.

Mr. Stainton read the following

Note on a curious little Geometra taken in London by Mr. Hunter.

"Some years ago Mr. Hunter met with a little species of Geometra, apparently of the genus Acidalia, in his garden in Bloomsbury Street. The specimen was unfortunately much injured on one side, and the other side was not so brightly marked as could have been wished; yet enough was left to show that it belonged to none of our existing species.

"In 1855 I examined this specimen, and referred it to the circuitaria of Hübner, remarking at the time, 'No good figure of this exists,' from which it may be assumed that I did not find a complete agreement between the insect and Hübner's figure. The reason of this is now obvious: Hübner's figure of circuitaria is cited by Guenée as an excellent figure; hence it cannot be intended for Mr. Hunter's insect.

"Mr. Hunter's insect thus loses the name by which it has passed current for two years, and what is to become of it? We all remember how we were startled by the announcement of Eriopus Latreillii having been bred at 24, Bloomsbury Street, and when I again looked at the little Acidalia I was haunted by lurking suspicions that, perhaps, what I had before me was only another case of accidental importation.

"Having been lately working at the genus Acidalia, I had the markings of each species fresh in my recollection, and I became very strongly convinced that this specimen must be placed near bisetata and trigeminata, in spite of the great difference in the ground colour.

"Referring again to Guenée's volume, I found, almost immediately following trigeminata, a species which not only answers our purpose of giving a name to Mr. Hunter's late circuitaria, but also affords us an explanation of the peculiar habitat of London for a new British Geometra.

"The insect in question is Acidalia herbariata and Fischer's figure of pusillaria is referred to as the best representation of the insect. The first glance at Fischer's figure was anything but reassuring: instead of the powdery-looking insect I had before me I saw a bright neat insect, with a well-defined dark central band. Not content with the figure, I referred to the description, which I found far more satisfactory.

"The ground colour of all the wings is pale loam-colour, mixed with black scales, which form fasciæ and strigæ, whence the markings appear blackish gray. The space between the base and the middle fascia is dull; the fascia is in many specimens 'very dark'; it seems to have been one of these that Fischer has figured 'broadest at an externally protruding point in which is a black dot, narrowest below the middle,

being rather broader again on the inner margin.' In the broader parts the pale ground colour appears through as spots. Beyond the fascia and parallel to it is a line, often very dark, behind which the space to the fringes is clouded with dark and bisected into two equal parts by a wavy line of the pale ground colour; the inner portion of these dark parts has below the middle two contiguous short streaks or spots pointing towards the cilia,—a character which no specimen is without.

"On the posterior wings are similar markings, except the central fascia, which is replaced by a dark cloudy stripe which borders the duller basal portion; beyond it near the following line and not far from the costa is a black longish *punkstrich*.

"The elongate form of the central spot of the posterior wings is well shown in Fischer's figure, and is perceptible in Mr. Hunter's specimen, and the two dark teeth so especially mentioned by Fischer are the most conspicuous markings of the anterior wings; hence, in spite of Fischer's very different-looking figure, I feel confident that his insect and Mr. Hunter's are the same.

"Now, how do we account for the insect occurring in London? One-half of the world little knows how the other half lives; and we may suppose that one-half of the geometric larvæ have little conception of what the other half feed upon. At any rate the tastes of this particular insect are very peculiar. It does not feed on a fungus like our other London friend, Boletobia fuliginaria, it does not feed on lichens or moss. On what then? On the dried plants in collections.

"We read in Fabricius, Supp. p. 457, 'Habitat in herbariis folia plantarum exsiccatarum exedens. Mus. Dom. Bosc.'

"I supposed Dom. Bosc was anything but pleased at this new collecting ground opened out to him; but if it be so that a geometric larva finds nutriment in dried plants it is well we should know of it, as a looper casually observed in a herbarium would be supposed to be there quite by accident.

"On referring again to Fischer we read that 'the perfect insect occurs at the end of July on palings and walls near houses, often indeed in houses, but especially in warehouses where dried plants are kept, since the larva feeds exclusively on dried plants, and as far as we know never touches green ones.'

"It feeds all through winter on these dry plants, and is sometimes very injurious to herbaria, changes in June to a pupa in a slight cocoon in a corner or between dried leaves, and in ten days or a fortnight the perfect insect appears.

"Now the whole mystery seems explained; and the occurrence of a devourer of dried plants in Bloomsbury Street, in the immediate vicinity of the British Museum, where perhaps more specimens might be obtained by a careful search, seems perfectly intelligible."

April 5, 1858.

J. O. Westwood, Esq., V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Proceedings of the Royal Society,' Vol. ix. No. 29; presented by the

Society. 'The Zoologist' for March; by the Editor. 'Catalogue of British Coleoptera,' by G. R. Waterhouse, Esq, F.Z.S., &c., two copies, one of them printed on one side only; by the Author. 'The Literary Gazette' for March; by the Editor. 'The Journal of the Society of Arts' for March; by the Society. 'Exotic Butterflies,' Part 26; by W. W. Saunders, Esq., F.R.S., &c. 'Stettiner Entomologische Zeitung,' xix. jahrgang, Nos. 1—3; by the Entomological Society of Stettin. 'The Entomologist's Weekly Intelligencer,' Vol. iii.; the same, No. 79; by H. T. Stainton, Esq. 'The Athenæum' for February and March; by the Editor. A pair of Carabus intricatus, *Linn.*; by J. J. Reading, Esq.

Election of Members.

Alexander Wallace, Esq., of Bembridge, Isle of Wight, and H. G. Knaggs, Esq., of Maldon Place, Camden Town, were balloted for and elected Members of the Society.

Exhibitions.

Mr. Stevens exhibited a specimen of Papilio Ulysses, taken by Mr. Wallace in Aru, and observed that Mr. Wallace saw this species on the wing almost daily during his three months' stay in the island, but, owing to its high and rapid flight, he only succeeded in capturing two examples.

Mr. Janson exhibited various Coleoptera, handed to him for that purpose by Mr. Douglas, which had been recently taken by that gentleman in nests of Formica rufa; the species most noteworthy were Saprinus piceus, *Ill.*, Dendrophilus pygmæus, *L.*, Leptacinus formicetorum, *Maerk.*, and Thiasophila angulata, *Erichs.*

Mr. Janson also exhibited a specimen of Harpalus servus, *Duft.*, which had been detected by Mr. H. Squire among a number of unset Coleoptera presented to him by Mr. F. Smith, by whom they were captured, near Deal, last autumn. He observed that Mr. Squire, who had identified this insect, considered it specifically identical with Harpalus maritimus (*Kirby*), *Steph. olim* (subsequently sunk, in the 'Manual,' as synonymous with H. complanatus, *Sturm.*), as he found the individual exhibited agreed precisely with the specimens thus denominated in the Kirbyan, Stephensian and Leachian cabinets. Mr. Janson remarked that he had not himself yet had an opportunity of following Mr. Squire's investigations in this matter; he was therefore not competent either to confirm or contradict the view he advanced.

Mr. Janson likewise laid before the Meeting the following, which he had recently taken:—

Ocyusa ruficornis, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 158, 2 (1856), a species not previously recorded as an inhabitant of Britain, and indeed only recently discovered by Dr. Kraatz, near Berlin. It has also been taken in the vicinity of Paris, and is described by MM. Fairmaire and Laboulbène in their 'Faune Entomologique de France,' i. 441, 33 (1856), under the name of Oxypoda fulvicornis: the specific title imposed by Dr. Kraatz will, however, stand by right of priority, his description being anterior in publication by several months. The present species may be at once distinguished from its near ally and as yet sole congener, O. maura, *Erichs.*, by its superior size, brown hue, longer antennæ, and by the bright brownish red colour of those organs and of the legs; other, less apparent, differences exist in the form of the thorax and in the sculpture and pubescence of the elytra, &c.

Hygronoma dimidiata, Grav., Erichs., Steph.

Stenus picipennis, Erichs., first discovered and identified by Mr. Edwin Shepherd, in the autumn of 1857, and subsequently taken, he had heard, by Dr. Power, in Hampshire.

Ischnodes sanguinicollis, Panzer (*Ctenicerus sanguinicollis*, Steph.). The female, which differs somewhat in size and form from the male, is unquestionably Sericosomus fulvicollis of Stephens.

In answer to a question of Mr. Westwood, relative to the localities in which these insects had been found, Mr. Janson stated that he had captured the last-named species in the London district; in respect to the other three, he was not certain whether the locality was situate within that limit or not,—at all events he might venture to say one of the home counties South of the Thames; this he considered quite sufficient for all scientific purposes, and most respectfully declined henceforth publicly to indicate the precise localities of his captures, an announcement which appeared to afford much amusement to some of the Members, as it was greeted with considerable hilarity.

Mr. Waterhouse exhibited the following species of Coleoptera, believing they had not hitherto been recorded as British, *viz.*:—

Hister marginatus, Erichs. Two specimens of this insect had come under Mr. Waterhouse's notice, one specimen in his own collection, and one in that of Dr. Power. The localities in which they were found are unfortunately unknown.

Saprinus immundus, Gyll. One specimen taken by Mr. Waterhouse, at the mouth of the Orwell, in September, 1855, and several specimens taken by Dr. Power and Mr. F. Smith, at Deal.

Saprinus metallicus, Fabr. Two specimens taken at Deal by Mr. F. Smith. This insect is given as British by Mr. Stephens, but he had mistaken the S. rugifrons, *Payk.*, for the species.

Abræus (*Acritus*) *nigricornis*, Ent. H. Found in the months of May and June in the corridor of the Crystal Palace.

Calodera riparia, Erichs. A single specimen taken by Dr. Power at Holme Bush.

Mr. Waterhouse also exhibited a specimen of a Plegaderus, which he supposed to be the P. dissectus, *Erichs.*, and stated that it was one of two specimens found in Windsor Forest by Mr. Samuel Stevens: a notice had already appeared relating to the discovery of the insect by Mr. Stevens, and Mr. J. F. Stephens, who published this notice in the 'Zoologist,' had regarded the insect as Abræus vulneratus, *Kug.*

Mr. Waterhouse then proceeded to describe four species of Staphylinidæ, which he believed to be new:—

OXYPODA NIGRINA.

O. *Nigra, opaca, sericeo-pubescens, pedibus fuscescentibus, corpore fusiformi, supra confertissime punctulato.* Long. 1 lin.

Very close to Oxypoda cuniculina, *Erichs.*, but rather smaller and usually of an uniform sooty black colour; the antennæ rather shorter, the terminal joint comparatively short and obtusely pointed; the elytra rather less strongly notched at the posterior outer angle; the tarsi (more especially the posterior pair) shorter. Head about one-third narrower than the thorax, rounded, convex; the parts of the mouth dusky; antennæ about as long as the head and thorax, gradually increasing in width to the

apex, the last joint decidedly the shortest; first and second joints moderately elongate, obconic, and nearly equal; third joint about half the size of the preceding; of the remaining joints the first two or three are quadrate or nearly so, and the remainder (with the exception of the last) distinctly transverse. Thorax gradually contracted from the base to the fore part, the sides and the posterior margin gently rounded; above convex and even, or with a very indistinct dorsal furrow. Elytra about one-fourth longer than the thorax and rather broader, the puncturing fine, and, being extremely dense, produce a dull appearance. Abdomen attenuated and also very finely and densely punctured, the last segment and the edge of the preceding one often fuscous. Legs more or less dusky, with the knees and tarsi fusco-testaceous.

I met with this insect at Charlton in June, 1856, and at Erith in July, 1855, and some other localities not distant from London; it is also found in Scotland, Mr. Morris Young having taken it at Paisley.

Oxypoda nigro-fusca.

O. *Fusco-nigra, thorace, elytris, abdominisque apice fuscis; pebidus testaceis; corpore fusiformi, supra confertim subtilissime punctulato.* Long. 1 lin.

It was with some little hesitation that I ventured to separate this species from O. hæmorrhoa, *Mannerheim*, so much does it resemble that insect in size and form, as well as in the structure of the antennæ; the fuscous thorax and elytra I at first thought might only be indications of immaturity; I found, however, that all the specimens which presented this colouring had the thorax dull, whereas in O. hæmorrhoa the same part is somewhat glossy, and upon placing the two insects side by side under a low power in the microscope, I soon perceived that the punctuation of the thorax was much more dense in the insect I call O. nigro-fusca.

Found in the *débris* left upon removing a stack of faggots in Bishop's Wood, near Hampstead.

Homalota plumbea.

H. *Plumbeo-nigra, opaca, griseo-pubescens, creberrime subtilissime punctata; antennis fuscis, pedibus fusco-testaceis; thorace subquadrato coleopteris multo angustiore; abdomine nitidiusculo.* Long. 1½ lin.

This species should be placed in Kraatz's second section, near to the Tachyusiform species, such as Homalota labilis, &c., in which the elytra are ample, distinctly broader than the thorax. It reminds one of H. incana, *Erichs.*, agreeing pretty nearly in size, form, and colouring with that insect, but it is much more thickly and finely punctured, and the antennæ are longer, and none of the joints are decidedly transverse; the legs, moreover, are paler. Head rather narrower than the thorax, convex and rounded, but with the eyes slightly prominent, and the parts of the mouth rather produced, the surface, like that of the thorax and elytra, of a somewhat dull and silky appearance, owing to the thickness and fineness of the puncturing, combined with a tolerable dense and fine ash-coloured pubescence; palpi and antennæ dusky, the latter sometimes, with the base, dirty testaceous; they increase very slightly in thickness towards the apex; the first three joints considerably elongated and very nearly equal; of the following joints the first are rather longer than broad, and the penultimate quadrate; the terminal joint nearly equal in length to the two preceding taken together. Thorax subquadrate, slightly emarginate in front; the sides presenting a very gentle sigmoid curve, being a little dilated and rounded towards the

fore part and slightly contracted behind; posterior margin rounded, posterior angles obtusely rounded; anterior angles rather acute; upper surface moderately convex, and with a somewhat large and shallow depression behind. Elytra ample, fully one-fourth longer than the thorax, and nearly twice as broad. Abdomen growing rather broader towards the hinder part, very thickly and finely punctured throughout. Legs testaceous; the femora and tibiæ more or less suffused with brown. I can perceive no differences indicative of sexes in the specimens before me.

Found by Dr. Power, at Seaford, near Newhaven.

Homalota imbecilla.

H. *Linearis, subdepressa, subtiliter pubescens, nigra, nitidiuscula, antennis pedibusque fuscescentibus, ano elytrisque testaceis, his basi fuscis; thorace transversim subquadrato; abdomine supra omnino crebre punctato.* Long. $1\frac{1}{3}$ lin.

Head very little narrower than the thorax, rounded and moderately convex, very finely and rather thickly punctured; antennæ, if bent back, reaching about to the apex of the elytra; slender and with no perceptible increase in thickness towards the apex; the penultimate joints as long as broad; the middle joints longer than broad; the terminal joint nearly as long as the two preceding joints taken together; palpi fuscous, paler at the base. Thorax subquadrate, slightly broader than long, straight in front, very gently rounded at the sides, and more distinctly rounded behind; above gently convex, very finely and thickly punctured, and with a shallow fovea behind. Elytra scarcely longer and very little broader than the thorax, and very thickly and rather finely punctured. Abdomen with all the segments thickly and finely punctured; the punctures, however, on the terminal segments are a little less dense than on the basal; from the apex of the abdomen spring numerous longish hairs. First joint of the posterior tarsi a trifle longer than the second.

I found several specimens of this insect under *rejectamenta* at the mouth of the Orwell, in September, 1855. It is a soft and delicate little insect, and subject to considerable variation in colouring, chiefly in the elytra, these being sometimes entirely pale and sometimes entirely pitchy, but usually they are dusky at the base, and this dark colour is more or less extended in different individuals; the apex of the abdomen is always pale.

H. imbecilla, together with H. fluviatilis, *Kraatz*, H. cambrica, *Wollaston*, and H. thinobioides, *Kraatz*, may be grouped together as linear species allied to H. elongatula, but distinguished by the abdomen being thickly punctured throughout.

H. fluviatilis—or rather an insect (found on the banks of the Thames, near Hammersmith, by Mr. Squire) which I suppose to be the species so named by Kraatz—approaches the nearest to H. elongatula, but differs in being rather smaller, in having the body black throughout, the antennæ dusky (or impure black) to the base, the head rather narrower and less rounded, the sides being nearly parallel, and the thorax rather longer.

H. imbecilla is about equal in size to the smallest specimens of H. elongatula; the antennæ are longer and more slender than in that insect, sometimes fusco-testaceous throughout, and sometimes entirely dusky; the legs of a less bright and clear colour, being more or less suffused with brown or dusky at the base.

H. cambrica is very like H. imbecilla, but its form is more slender, its elytra are longer, and the punctuation is finer and more dense; that on the thorax and elytra,

indeed, is so delicate as to be scarcely perceptible under a strong Stanhope lens, whilst in H. imbecilla the puncturing throughout is tolerably distinct.

H. thinobioides is the smallest of the group and the most slender in its make, but very like H. cambrica: its colouring is darker, and the punctuation of the abdomen is still more dense.

This note is made upon specimens from Madeira, given me by Mr. Wollaston.

Mr. Westwood remarked the admirable manner in which the Abræus exhibited by Mr. Waterhouse was set, every tarsus being spread out. Mr. Waterhouse thereupon informed the Meeting that the plan he adopted to set out small Coleoptera, of this and some other families, was to gum the insects slightly down on their backs (using gum Arabic for this purpose): the legs, &c., were then readily spread out with a camel's-hair pencil, after which the insect was easily removed by gently inserting the point of a pen-knife under it, and then placed in its proper position on gummed card: by this simple process many species could be set out, of which it is otherwise almost impracticable to display the limbs.

Mr. Waterhouse also detailed another plan, which he had found very useful, in setting out those tribes of small Coleoptera in which the limbs are rigid, such as the Curculionidæ, &c., *viz.* to gum the insects on card, without attempting to set out the legs, &c., until the gum has dried, when by slightly moistening the limbs, on one side of the insect only, they were very readily brought to their required position with the setting needle, and, on their again becoming dry, the other side could be treated in a similar manner; by gumming out several insects at once no time need be lost, as whilst one specimen was under process, the others would be drying.

Mr. Tegetmeier exhibited a newly constructed bee-hive, which consisted of two or more boxes, designed to be placed one above the other, each one furnished with moveable bars, to which the combs are attached, thus affording great facility for the removal of the latter, either for the purpose of scientific research, the partial deprivation of honey, or the artificial production of swarms. The bars are retained in their places by long wooden slides passing between them, which obviate the necessity for covers, enable a single bar of comb to be removed without disturbing those remaining, and permit the removal of the top boxes to be most readily accomplished. The boxes are square in form, and so constructed that bars of brood or honey-comb can be easily transferred from one to another.

Some discussion having arisen relating to the construction of the cells of the hive bee, Mr. Waterhouse stated that he was of opinion that the hexagonal form of cell was accidental, so far as the constructors of the cell were concerned; and, having been called upon to explain his views, he proceeded, in the first place, to call attention to the fact that if a number of cylinders of equal size were packed close together, side by side, each cylinder would be surrounded by six others; that, assuming the cylindrical form (or at least a form of cell approaching more or less to the cylindrical, and having a circular section) was the type form of isolated cells constructed by different kinds of bees, and that, in the case of the hive bee, a number of insects worked together, first depositing a small portion of wax, then excavating a small circular cavity in the same, for the commencement of a cell; this then being followed by the deposition of more wax and the excavation of more cavities, and these being placed close to the first; then neither of the cells could be constructed of their natural diameter,

provided the first cavity formed had not attained the full diameter of the complete cell. The diameters of the cells would intersect each other; but, if partitions be left between them, the cell must be six-sided, if the cells remain equal in size. In order to make the idea more clear, he (Mr. Waterhouse) would assume for a moment that it were a law that a number of equal-sized circles, being packed closely together, side by side, and that each circle was then surrounded by seven others; he believed that the cell of the hive bee would, in that case, have been seven-sided. Such were the views entertained many years back by Mr. W., and published by him in the 'Penny Cyclopædia;' and having subsequently had his attention particularly directed to the subject, whilst examining the nests of a vast number of Hymenopterous insects, he still believes those views to be essentially correct. He now, however, has reason to believe that it is not absolutely necessary for the supposed natural diameters of the cells to intersect before an angular-formed cell would be produced. The instinct which leads an insect to excavate, in order to form a cell, may lead it to excavate beyond what would be necessary to form a sufficiently large cell, in the case of an insect, which, under ordinary circumstances, burrows until it comes in contact with an adjoining cell. Contact with other cells was the essential condition which influenced the angular form of any particular cell. It has been brought as an objection to his theory, Mr. W. went on to say, that, in the case of the wasp or hornet, a single female insect constructs hexagonal cells. This is true, but the same principle obtains,—no wasp builds a single, isolated, hexagonal cell; when wasps, or allied Hymenoptera, build hexagonal cells, many cells are built almost simultaneously, the first cell has made the least possible progress before six other cells are commenced around it, and these again have progressed very little before others are commenced external to them and in their interstices, so that a wasp's cell may be said to be altered into the hexagonal form as it proceeds, excepting in the case of the outermost series of cells, where only the inner side of each cell is angular, the outer side being almost always rounded. Mr. Waterhouse said he had possessed a very small nest of a hornet which consisted of three cells only; it was built in a small cavity adjoining a large nest, and where there was not room for more than three cells; they were circular externally and angular internally,—that is to say, each cell had two straight sides where it came in contact with two other cells, and was rounded elsewhere.

Mr. Tegetmeier remarked that he possessed a small piece of honey-comb which presented the same peculiarities.

Mr. Tegetmeier added that he had found it a great improvement to have double glass to observatory hives.

In answer to a question from Mr. Lubbock, Mr. Tegetmeier stated that he had not made any observations, confirmatory or otherwise, of the theories advanced by Professor Siebold, relative to the reproduction of these insects.

Mr. Murray observed, with reference to this subject, that Professor Simpson had transferred eggs from drone to queen cells, and that a larva produced therefrom grew so large that at length it reached the glass of the observatory hive in which the experiment took place, and then died: he thought it would be interesting to have this grub dissected, in order to ascertain whether it was a female or not.

Part 7 of Vol. iv., new series, of the Society's 'Transactions' was on the table.

May 3, 1858.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1856, Nos. 2—4, and 1857, No. 1; presented by the Society. 'Catalogue of the Lepidopterous Insects in the Museum of the East India Company,' by Thomas Horsfield, M. and Ph. D., F.R.S., Keeper of the Company's Museum, and Frederic Moore, Assistant, Vol. i.; by the Hon. Court of Directors of the East India Company. 'Proceedings of the Royal Society,' Vol. ix, No. 30; by the Society. 'Proceedings of the Zoological Society,' Nos. 339—349, both inclusive; by the Society. 'The Zoologist' for May; by the Editor. 'Abhandlungen de Mathemat-Physikalischen Classe der Königlich Bayerischen Akademie der Wissenchaften,' Vol. viii. Part I.; 'Ueber den Auban und Ertrag des Bodens im Königreiche Bayun,' Part I., by Dr. F. B. W. Hermann; by the Akademie. 'The Athenæum' for April; by the Editor. 'The Literary Gazette' for April; by the Editor. 'The Journal of the Society of Arts' for April; by the Society. 'List of the Specimens of Homopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., &c.—Supplement; by the Author. 'A Manual of British Butterflies and Moths,' No, 16; by the Author, H. T. Stainton, Esq. 'The Entomologist's Weekly Intelligencer,' Nos. 79—83; by the Editor, H. T. Stainton, Esq.

Elections.

Robert Mc Lachlan, Esq., of Park Road Terrace, Forest Hill, and Alfred Boot, Esq., of Park Row, Greenwich, were elected Members; and Joseph Stevens, Esq., of Upper Richmond Road, Wandsworth, a Subscriber to the Society.

Exhibitions.

Mr. Majendie sent for exhibition a piece of beech bark covered with a white substance, which Mr. Westwood pronounced to be a secretion exuded from the body of the female of a species of Coccus, of which the male is as yet unknown.

Mr. Shepherd exhibited specimens of Stenus solutus, *Erichs.*, taken in the London district, observing that the species had been recorded as British in Mr. Waterhouse's recently published Catalogue, on the authority of a single specimen in the collection of Dr. Power.

Mr. W. F. Evans sent for exhibition living examples of the larva and imago of a species of the Rhynchophorous genus Prypnus, *Schoenh.*, which he had found in bulbs imported from the Cape of Good Hope.

Mr. Horace Francis exhibited various Coleoptera which he had met with in the vicinity of Folkestone, in September last, including beautiful examples of Anchomenus livens, *Gyll.*, and Ocypus (Goerius) cyaneus, *Fab.*

Mr. Janson exhibited the following Coleoptera, recently captured by him within a short distance of the metropolis:—

Oödes Helopioides, Fab., a species which he had not before taken, and which appears to be this year unusually abundant, having been found in considerable numbers in Kent, by Mr. Lewis, Mr. Douglas, Dr. Power and others: the series now before the Meeting were taken in the adjoining county of Surrey.

Badister peltatus, Panzer, a single individual found on the 19th of March last, under loose bark of willow, in the notorious Hammersmith, or, perhaps more correctly, Shepherd's Bush Marshes. The synonymy of and references to this species should be thus expressed: Carabus peltatus, *Panzer*, *Faun. Ins. Germ.* Fas. xxxvii. tab. 20 (1797), probably figured and described from a very immature specimen, with the head and thorax ferruginous, the elytra pale brassy, and the antennæ and legs entirely testaceous, a state of things so different from the ordinary aspect of the insect as to render identification, if not impossible, at least very problematical and unsatisfactory; *Illiger*, *Verzeichn. d. Küfer Preuss.* 197, 80 (1798); *Duft. Faun. Austr.* ii. 147, 193 (1812). Amblychus peltatus, *Gyll. Ins. Suec.* ii. 76, 2 (1810). Trimorphus Erro, *Newman* (*olim*), *Ent. Mag.* v. 489 (1838); *Steph. Man. Brit. Col.* 23, 134 (1839). Badister peltatus, *Sturm*, *Deutschl. Faun. Ins.* iii. 189, 3, tab. lxxvi. fig. a, A (1815); *Dej. Spec.* ii. 408, 4 (1826); *Iconogr.* ii. 226, 4, tab. 101, fig. 3 (1830); *Heer*, *Faun. Col. Helv.* i. 49, 3 (1838); *Erich. Küf. d. Mark Brand.* i. 24, 4 (1839); *Schaum*, *Ent. Zeit. Stett.* ix. 37 (1848); *Ann. and Mag. Nat. Hist.* 2nd series, iii. 35 (1849); *Newman*, *Zool.* 2276, 2277 (1848); *L. Redtb. Faun. Austr.* 82 (1849), 2nd ed. 31 (1857); *Dawson*, *Geod. Brit.* 61, 3, tab. 1, fig. C (1854); *Fairm. & Laboulb. Faun. Ent. Franc.* i. 63, 4 (1854); *Schaum*, *Naturg. d. Ins. Deutschl.* i. 352, 4 (1857).

Cossonus linearis, Linn., Schoenh., Steph., Walton. A species, judging from the old cabinets, frequently met with in Britain in days of yore, but which has probably not occurred for nearly twenty years, specimens having been taken by Dr. Power, in Cambridgeshire, about that period, since which apparently no instance is on record of its capture. The series now exhibited was taken a few days since in an old elm, which literally teemed with the insect in all its stages, the semi-decayed portions of the tree being riddled in all directions by the larvæ, and the *débris* mingled with the remains of countless members of bygone generations.

Stenus solutus, Eric., captured at the same time and place as the specimens previously exhibited by Mr. Edwin Shepherd, to whom I am indebted for the opportunity of taking this scarce and local species.

Lathrobium punctatum, Zetterstedt, Faun. Ins. Lappon. i. 84, 5 (1828), to whom, and not to Nordmann, this species must be assigned, he having first elaborately described it under this name.

Mr. Westwood remarked that Cossonus linearis used to be taken in Battersea Fields.

Mr. Janson rejoined that it was certainly not there that he had met with it: little anxiety need, however, be felt as to the precise locality which had yielded it, as he had not only secured but set out an ample supply for all his friends, and specimens (a dozen if he desired them) were quite at Mr. Westwood's service.

Mr. Gloyne observed that he had taken a specimen of Oödes Helopioides on the banks of the Thames, near Mortlake.

Mr. Stainton exhibited a new species of Cemiostoma, bred by Mr. Wailes, of Newcastle-on-Tyne, from larvæ mining the leaves of Genista tinctoria, for which the

name Wailesella had been proposed: the insect was closely allied to C. spartifoliella and laburnella, but smaller, and with a bluer tint than those species.

Mr. Westwood wished to know whether the larvæ of these closely-allied species fed on closely-allied plants; if so it was most probable that they were not distinct species, but merely modifications produced by the difference in the food plant.

Mr. Stainton observed that, independently of the differences in the larvæ and perfect insects, differences which truly were minute, there were differences of habit, especially between the larvæ, which would render it difficult to refer them to the same species; and to assume that because the differences were small, and because the larva fed on a different plant, the difference of food should so modify the insect in all its stages, seemed rather like begging the question: it was *possible* the effect of the food might be to alter the appearance of the insect, but that was certainly a point which required to be *proved* before it could be admitted.

Mr. Smith exhibited a Stylops which he had bred from a living example of Andrena fuscata, *Kirby:* it emerged from the pupa at half-past nine o'clock that morning, and although he endeavoured, by keeping it in as cool a place as possible, to preserve it alive to exhibit that evening, it died at about half-past four o'clock: he believed it to be the same species which he had lately figured in the Society's 'Transactions,' or certainly a very closely-allied species.

Mr. Smith also exhibited a piece of tube formed of vulcanized India-rubber, containing cells of the leaf-cutter bees: the cells were placed transversely in the tube, which he considered an extraordinary instance of sagacity in the bees.

Mr. Stevens exhibited some butterflies, taken in Amboyna by Mr. Wallace, including beautiful males of Papilio Ulysses, and the female of this species, the Papilio Diomedes, *Cram.*; also Papilio Codrus, and some fine Pieridæ.

Mr. Waterhouse exhibited the following Coleoptera, from the Collection of Dr. Power:—

Tachyusa sulcata. Taken at Southend.

Homalota orbata. Taken at Merton.

Agaricochara lævicollis. Taken at the Holt, Hampshire.

Oligota granaria. Taken at the Holt, Hampshire.

Xantholinus glaber. Taken at Holme Bush.

Quedius fuscipes. Taken at Addington.

Stenus solutus. Taken at Cowley and Lee.

Stenus ——— (sp. 20 of Mr. Waterhouse's Catalogue). Taken at Shirley. Mr. Waterhouse observed that this insect, in some respects (especially in the dark colouring of the palpi), more perfectly agreed with the description of S. providus, *Erichs.*, than did the species which he had supposed was that insect, and which, from its more cylindrical form, he now thought might prove to be Kraatz's S. Rogeri. Before, however, this point could be settled, it would be necessary to ascertain the sexual characters of Dr. Power's insect, of which one specimen only had been found.

Philonthus signaticornis. Taken at Eastcot and Merton.

Philonthus nigrita. Taken at Eltham.

Philonthus pullus. Taken at Portsea.

Philonthus lepidus. Taken at Deal.

Mr. Waterhouse also exhibited the following species from his own collection:—

Oxypoda aterrima, nov. sp.

Anisotoma obesa, Schmidt, *A. ciliaris*, Schmidt, *A. brunnea*, Sturm, *A. parvula*, Sahl.

Cyrtusa minuta, Ahrens.
Agaricophagus cephalotes, Schmidt.
Leiodes orbicularis, Herbst.
Euthia plicata, Gyll., *E. truncatella*, Erichs. First taken by Mr. Whittingham at Leytonstone, and subsequently by Mr. Waterhouse at the Crystal Palace.

Mr. Waterhouse read the following description of the new species of Oxypoda exhibited by him:—

"Oxypoda? aterrima.

"O. *lincaris, aterrima, nitidiuscula, antennis pedibusque piceo-nigris, thorace elytrisque crebre punctatis, abdomine parcius punctato; thorace coleopteris longitudine subæquale, basi foveola impresso.* Long. corp. 1 lin.

"This little insect is extremely like Homalota analis, but is usually a trifle larger: the antennæ are distinctly shorter, a little stouter, and with the intermediate joints strongly transverse; the head rather more globose and less suddenly constricted behind; the thorax rather less transverse, but in other respects like, with the same posterior fovea and indistinct dorsal channel; the punctuation, however, of this part, as well as of the elytra, is rather stronger: the elytra are very nearly equal to the thorax, both in width and length, and present scarcely a trace of the posterior notch: the abdomen is rather less finely and less thickly punctured than in H. analis; the three visible segments nearest the elytra are transversely impressed at the base; the jaws are testaceous; the palpi dusky.

"Several specimens of this insect have been taken by Mr. Morris Young near Paisley: its general appearance is so like that of a Homalota (especially H. analis) that I was much surprised, upon placing it under the microscope, to find five joints to the fore tarsi, and this character accompanied by a somewhat elongated basal joint to the posterior tarsi: this joint, however, though decidedly longer than the following joints, is less elongated than in most of the Oxypodæ."

Mr. Westwood exhibited a drawing of a dark variety of Acronycta Ligustri, and of the larva from which it had been bred by Mr. Henry Boyle.

Captain Cox sent for exhibition a portion of a hop-pole perforated by the larva of a Coleopterous insect, apparently a Callidium.

Mr. Stevens communicated the following extract from a letter written by Mr. H. W. Bates, from Sto. Paolo, Upper Amazons:—

"On arriving at this station, one of the first new acquaintances in the butterfly department which greeted me was the very beautiful Pandora Prola, *Boisd.*,—at least I suppose it to be this species, from the nearly spotless scarlet colour of the under surface of posterior wings; it was flying wildly about the streets of the village, entering houses by the windows and settling on the walls: since then I have always seen one or two on every very hot sunny day: the species does not penetrate the forest; it is found only about the houses, and at a spot on the borders of the forest where the vultures roost: its habits altogether are unlike those of any other species of Nymphalidæ; it settles frequently, sometimes on the ground, attracted by offal, but frequently on the trunks of trees, bare walls, &c., holding in repose its wings slightly raised: it is excessively wary, and only during the very hottest weather allows itself to be approached: I have captured several on my own person, as, when standing about waiting an opportunity to obtain it, it is apt to sail up boldly and settle on one's

clothing; its habit of settling on the trunks of trees and its bold rapid style of flight very much resemble the manner of the Ageroniæ, and I am quite satisfied that the true position of the genus Pandora is in proximity with Ageronia. There are two grand species of this latter genus new to me also found here, one of which has the greater part of the under surface of the hind wings red, and the other has the same part saffron-yellow: they fly in company with Pandora at the place on the borders of the forest, but do not wander so far in their flight. I wish to mention here that I think there is quite an erroneous conception established by lepidopterists, of the nature and affinities of the Ageroniæ. M. Lacordaire and Mr. Wallace have said that the chrysalis is secured by a ligature round the body; I think there is some mistake about this: I have bred two species of the genus, and most certainly the chrysalis is suspended by the tail like all the other Nymphalidæ. In our systems the Ageroniæ are placed at the head of the Nymphalidæ, near the true Papilionidæ, as though forming the connexion between the families. I think all this is a misconception. There is no proximate affinity at all between the Papilionidæ and the Nymphalidæ; the two families are separated by the whole mass of the Erycinidæ. I should as little expect to find an Ageronia chrysalis with a ligature round the body, as a true Papilio chrysalis suspended only by the tail. The larvæ of Ageronia are spinose; the lines of thoracic segments densely ramose. In their flight they make a smacking noise with their wings like the clicking of castanets, but rarely repeated. The Pandora does not produce this noise."

The Secretary read the following paper by Mr. A. R. Wallace:—

A disputed case of Priority in Nomenclature.

"Allow me to call the attention of the Entomological Society to what seems to me a novel and most erroneous as well as inconvenient interpretation of the law of priority: it is, that of transferring a name long borne by one insect (but which it has lost by being found to be but a sex or variety) to another insect which has been erroneously referred to the same species. This has been done by the late Mr. Doubleday, who has changed Ornithoptera Remus, a name which for fifty years has been invariably borne by one well-known species, into O. Panthous, a name which for a still longer period has been applied to the female of O. Priamus. Such a change would be most inadvisable, even were the principle on which it was made a good one; whereas it is one which gives, at it were, a premium to error. Linnæus described the female of Priamus as a distinct species (Panthous) and Remus as the male of Panthous. Cramer corrected the latter error and figured the two sexes of Remus correctly, giving the species for the first time a distinct name. This name it appears to me cannot be changed for that of Linnæus, who erroneously supposed the species to be the same as one he had previously named, although that name has been reduced to a synonym. The two errors of Linnæus should not be allowed to take precedence of Cramer, who first correctly named the species. The question here raised is of importance because an analogous case is now open for decision. P. Darsius of G. R. Gray was previously figured by Doubleday as the male of Amphimedon. Now, Amphimedon is certainly the female of Helena, and, if the rule holds good, the new species Darsius must take the old name of Amphimedon, just as Remus has been made by Messrs. E. Doubleday and G. R. Gray, to take the name of Panthous. Such a practice will certainly not be generally followed, and I would humbly suggest that it is one of the duties of an Entomological

Society, to check, by an expression of their opinion, all that tends still further to confuse the nomenclature and synonymy.

"Amboyna, January 1, 1858."

The Secretary read "Descriptions of six New British Neuroptera sent by Mr. Dale to the British Museum," by Dr. Hagen; and the following paper by Mr. Newman:—

Note on Scolytus destructor.

"Having heard from Mr. Stainton that the Royal Botanic Society had awarded a gold medal to our fellow-member, Captain Cox, for certain successful experiments in recovering elm trees from the attacks of Scolytus destructor, I was delighted to receive for the press that elaborate paper with which the Society was favoured at its last meeting. That paper is published in our 'Proceedings,' and will afford to the world abundant proof that we are now regarding Entomology in a utilitarian as well as a scientific spirit. 'It is,' as the writer observes, 'peculiarly fitting that Science should step in and prove that over one pest at least we have power, and if not made use of the fault lies entirely with the public.' I cannot sufficiently regret my absence from so interesting a meeting, since, had I been present, I should have endeavoured to elicit still further information from a gentleman who has so successfully studied this important branch of rural economy; more especially, as the Parisians, in their bungling attempts to employ the draw-shave, have sacrificed the finest elm trees around the French metropolis. I may perhaps be allowed to state, touching the bibliography of Scolytus destructor, that I think Captain Cox scarcely goes back far enough, when he dates the knowledge of its economy from 1840: previously to that year the late M. Audouin had thoroughly mastered its history; and six years earlier still, an obscure writer in the 'Entomological Magazine' (i. 425), under the assumed name of 'Rusticus'—the habit of assuming names cannot be sufficiently reprobated—described its economy so minutely as to induce the idea that Captain Cox must have been at the writer's elbow even while he held the pen, and dictated what he wrote: before Rusticus, Kirby and Spence seem to have been cognizant of its doings; and to go back still further, the very name carries with it an idea of some knowledge of its economy. Captain Cox has, however, added one most interesting fact overlooked by previous writers: that 'the female dies at the entrance of her tube, thus performing a maternal duty by closing the aperture to her young ones with her own dead body.' The points, however, on which I would solicit for the Society additional information are these: Captain Cox states his firm conviction that healthy trees are attacked by Scolytus; and that this insect is the cause of premature decay and eventual death. He narrates with great perspicuity that eighteen dying elm trees were placed at his disposal, that he experimented on every one of them, by taking off the surface bark with a draw-shave; and that seventeen out of the eighteen completely recovered: the operation is most simple, and I believe every one will admit that its very simplicity adds to its beauty and its value. Before commencing his experiments, Captain Cox numbered the trees from 1 to 18, and made a careful memorandum of the state of each; the summary of these memoranda may be thus briefly stated. Fifteen were suffering severely from the ravages of Cossus ligniperda; and out of these fifteen, nine were also infested with Scolytus: three, making up the eighteen, were attacked by Scolytus, but all these three "slightly." Now, to a superficial observer, it will occur

that the state of the trees, scarcely bears out the author's own conclusion as to Scolytus attacking sound trees, since fifteen out of the eighteen were manifestly attacked by the most deadly enemy that a timber tree can possibly have: and to a *superficial* observer, I purposely repeat this qualifying expression, nothing can present a more sickly or abnormal appearance than a tree, the solid timber of which is riddled through and through by the enormous larvæ of Cossus ligniperda: such trees, with or without the smaller pest, I should have unhesitatingly pronounced in an unhealthy state. When Captain Cox favours us, as I doubt not he will, with an explanation of this apparent inconsistency, arising probably from some accidental oversight or transposition of words, may I ask him to reexamine the larvæ which he denominates those of Cossus ligniperda, and which had so severely injured the fifteen trees under consideration; because I never happened to find that insect feeding on elm, and had not the statement been made by an entomologist who possesses an unusually extensive knowledge of the larvæ of our British Lepidoptera, I should have fancied that the trees were dying from some other and undiscovered cause. One other slight difficulty occurs to me which will, doubtless, be removed without causing any additional or unnecessary trouble to Captain Cox. Seeing that the larva of Cossus mines the solid wood, and not the bark, except in its very juvenile state; and seeing that the fifteen Cossus-mined trees completely recovered after their outer bark had been merely draw-shaved, how is it to be explained that this simple external process affects the deadly Cossus deep in the interior? The author has not explained this, probably concluding that entomologists were more intimately acquainted with the reciprocal offices of bark and solid wood, than I fear is the case. I trust that these queries, unimportant in themselves, will not be deemed irrelevant, but will acquire some importance from the acknowledged importance of the subject; I hope they will induce Captain Cox to enrich our 'Proceedings' with a second paper still more explanatory than the first. As an observation on Scolytus, quite independent of the paper to which I have been alluding, it is rather interesting that in the two great London colonies of this insect, Greenwich Park and Camberwell Grove, its advent dated two years subsequently to the introduction of gas, and its ravages have not yet extended beyond the reach of the gas influence: that gas has an injurious effect on elms is a self-evident fact, so probably have all gases evolved by combustion in factories, since we always see elms in manufacturing cities losing their leaves six or seven weeks earlier than in the country: in this weakened state trees are particularly obnoxious to the attacks of insects, and about London elm trees are generally infested with the larvæ of Scolytus destructor and Zeuzera Æsculi. I am well aware of the alleged fact of the trees in the Hartz forest and elsewhere in France and Germany being destroyed by Scolytus, still the coexistence of elm failure and gas-lights must remain an indisputable fact, although at present a fact from which no general conclusions can be safely drawn."

Mr. Westwood observed, with reference to the latter part of Mr. Newman's paper, that the Scolytus was abundant in Christ Church Meadows, Oxford, far away from gas-lights."

June 7, 1858.

J. O. Westwood, Esq., V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'First and Second Report on the Noxious, Beneficial and other Insects of the State of New York, made to the State Agricultural Society, pursuant to an appropriation for this purpose from the Legislature of the State,' by Asa Fitch, M.D.; presented by the author. 'Journal of the Proceedings of the Linnean Society,' Vol. ii., No. 8; by the Society. 'The Natural History Review,' Vol. v., No. 2; by the Dublin University Zoological Association. 'A Monograph of the Asiatic Species of Neptis and Athyma, two genera of Diurnal Lepidoptera belonging to the Family Nymphalidæ,' by Frederic Moore; 'Descriptions of some New Species of Lepidopterous Insects from Northern India,' by Frederic Moore; by the Author. 'Annales de la Société Entomologique Belge,' Tome premier; by the Society. 'Bibliotheca Historico-Naturalis,' Vol. vii., No. 1; by the Author, E. A. Zuchold. 'The Zoologist' for June, 1858; by the Editor. 'List of the Specimens of Lepidopterous Insects in the collection of the British Museum,' by Francis Walker, F.L.S., &c.; Part xiv. —Noctuidæ; by the Author. 'Report of the Proceedings of the First Meeting of the East Kent Natural History Society;' by Captain Cox. 'The Journal of the Society of Arts' for May; by the Society. 'The Literary Gazette' for May; by the Editor. 'Descriptions de Six Longicornes Exotiques Nouveaux,' par M. Chevrolat (from Archiv Entom.); presented by the Author.

Exhibitions.

Mr. Stevens exhibited a number of Coleoptera found in nests of Formica fuliginosa and F. rufa, amongst which were examples of Myrmedonia cognata and M. lugens, and a fine series of Dinarda Maerkelii, taken near Guildford, of which he distributed specimens amongst the members present.

Mr. Smith exhibited a specimen of Myrmica cingulata, found by Mr. S. Stevens in a nest of Formica fusca, and examples of Myrmica lippula and Ponera contracta, found by Mr. Janson in company with Formica fuliginosa; he wished those entomologists who were in the habit of searching for Coleoptera in ants' nests would bear in mind that several rare species of Myrmicidæ are only to be met with in the nests of the different species of Formica, and that two or three such species of Myrmica well known to continental entomologists have not yet been discovered in this country.

Mr. Janson exhibited an example of a species of Trichonyx, found by Mr. E. Shepherd in a colony of Formica flava, under a flint on the "Hogsback," near Guildford, on the 21st ult. Mr. Janson observed that it was the same species which he had alluded to in his paper on Coleoptera frequenting ants' nests, in the 'Entomologist's Annual' for 1857, but he had not yet been able to identify the insect with either of the two known continental species of this genus.

Mr. Janson also exhibited specimens of an Hemipterous insect which he had taken on several occasions in nests of Formica rufa at Hampstead and Highgate, and which he was disposed to refer to the Microphysa myrmecobia, *Maerkel*, in Germ. Zeitsch. f. d. Ent. v. 262, 276 (1844), with whose description the individuals before the

Meeting agreed pretty closely, differing, however, somewhat in the sculpture of the head and thorax. He remarked that he had met with the male only, the female, according to Germar, has the hemelytra truncate—a structure obtaining in M. Pselaphiformis, *Westwood*, Annales de la Soc. Ent. de France, iii. 642, tab. vi. f. 3 (1834). [Loricula Pselaphiformis, *Curtis*, Ent. Mag. i. 197 (1833); Microphysa pselaphoides, *Burmeister*, Handb. d. Entom. ii. 286 (1835)], and which may possibly prove to be the female of the present species, although here the apical joints of the antennæ are decidedly the longest, and the rostrum is broad and scarcely exceeds the head in length.

Mr. Westwood observed that so long a period had elapsed since his attention was given to the species in question, that he could not then express an opinion in this matter; the specimen which Mr. Janson had placed in his hands would enable him to institute a comparison, the result of which he would communicate at a future time.

Mr. Stainton exhibited a specimen of a new species of Cemiostoma, bred by Mr. T. Wilkinson, from Lotus, and for which the name "Lotella" had been proposed: the insect is closely allied to C. scitella, from which it differs in the narrower anterior wings, the different position of the radiating dark lines in the cilia, and in having the apical spot from which these lines appear to emanate, black, instead of tawny as in scitella.

Mr. F. Smith exhibited two hermaphrodites in the aculeate Hymenoptera, *viz.*, a specimen of Nomada baccata, and of Andrena nitida; in both insects the male characters were on the right side of the body.

Mr. Douglas exhibited pupæ of a Lepidopterous insect found under bark of sycamore, and presumed to be those of Stigmonota Regiana; also a living example of Trinodes hirtus, and a specimen of Acrognathus mandibularis, a Coleopterous insect new to this country, taken at Darenth Wood, about three years ago.

Mr. Westwood exhibited a fine specimen of the Carpocapsa, which he had recently bred from the Mexican "jumping seeds," for which he proposed the name of

Carpocapsa saltitans.

C. *Alæ anticis griseo-albis cinereo rivulosis; costa lineolis circiter* 16 *obliquis alternatim tenuibus, angulo apicali nigricanti plaga parva ovali albida; margine postico prope basin macula parva quadrata nigricanti, plagaque postica magna conica cinerea, nigro lineata et marginata; margine apicali griseo plumbeo et albo variegato serie duplici punctorum minutorum nigrorum; alis posticis fuscis; capite et collari brunnescentibus; palpis extus fuscis, intus albidis.* Expans. alarum antic. lin. 9.

Hab.—Larva in seminibus plantæ Peruvianæ Calliguaja dictæ, quæ motu saltatorio mire progrediuntur.

Mr. Westwood exhibited a drawing, lately received by Mr. Spence from India, of the winged male and apterous worker of a species of Dorylus, together with the larva and pupa of the latter, which had been communicated to Herr Neitner by the Hon. Walter Elliot. The male is of the ordinary Dorylus form, that sex having only hitherto been observed, but the worker is a species of Mr. Westwood's genus Typhlopone. Herr Neitner's letter is as follows:—

" Rambodde, Ceylon, March 24, 1858.

" W. Spence, Esq., London.

" Dear Sir.—When at Madras, a few weeks ago, my friend the Hon. Walter Elliot showed me an entomological sketch, a copy of which I beg to enclose, asking me what the insect represented was. There can be no doubt that it is a Dorylus, and of great interest, as it represents two sexes, and as Mr. Elliot has observed their domestic habits. With regard to the latter, Mr. Elliot states that a couple of years ago he found a large society of these insects at Collenada, near Coringa, north of Madras, at about 17° N. L. They lived in the manner of ants, under the stone foundations of a house built on loose sand, within half-a-mile of the sea-coast: the society was very numerous. Mr. Elliot brought away a number of the insects, and had a drawing made of them by a native draughtsman: the enclosed sketch is a copy of it, also made by a native draughtsman. [The drawing represents the male insect of the natural size and in different positions, with magnified details of the antennæ, legs and genitalia; also the worker of the natural size, and magnified with details, and with the larva and pupa]. There can be no doubt that these insects are closely allied to the social ants. The difference in size of the male and the worker is very remarkable. The female remains still to be discovered: still I feel confident that the enclosed sketch and Mr. Elliot's observations will interest you as much as they have interested me, and will be generally considered as an acceptable addition to the natural-history of the genus Dorylus."

Mr. Thwaites, by whom Herr Neitner's letter was transmitted to Mr. Spence, adds that "it is very interesting to find Shuckard's conjecture that Typhlopone would prove to be of the Dorylus family verified. Shuckard's paper on the subject is in the 'Annals of Natural History' for 1840: his idea of its being a parasite, is, however, certainly disproved by this discovery of Mr. Elliot."

Mr. Westwood added that Mr. Shuckard, in his 'Monograph on the Dorylides,' referred to by Mr. Thwaites, had suggested that Typhlopone was composed of females of Labidus, and had consequently removed the former from the family of the ants, considering the Dorylides as an osculant family between the Mutillidæ and Formicidæ, whereas he (Mr. Westwood), in the Arcana Ent. i. 73, had shown Typhlopone to belong to the family of the ants, and had considered the Dorylides as a section of the Formicidæ, doubting, at the same time, the supposed sexual connexion between Typhlopone and Labidus.

Mr. Smith observed that the communication was certainly very interesting: Dr. Savage had, however, to his own satisfaction, settled the relationship of Dorylus some years ago. In the 'Proceedings of Natural Sciences of Philadelphia' for 1850, a communication from Dr. Savage states, that he found in Africa a number of specimens of Dorylus in company with a new species of Anomma, "A. rubella, *Sav.*"; the latter he considers to be the workers of Dorylus, yet, notwithstanding this opinion and the details given, Mr. Smith expressed his doubts of there being any specific connexion between these insects; they were not even found in a nest, but upon the ground, the Dorylus being mixed with a procession of Anomma. Although great disparity in the size of the sexes of some species of ants was well known, no instance of the male so greatly exceeding the worker had come under his notice, and in India Dorylus was common, whilst Anomma has not yet been found. Mr. Smith was far more inclined to adopt the opinion of Dorylus being the male of Typhlopone, but he

did not consider the communication decisive upon that point; the Dorylus it appeared had been discovered in the same nest, or in company with workers of Typhlopone, but the female had not been discovered, and Dorylus might yet prove to be a parasite. Mr. Shuckard had suggested the probability of Labidus, the New World representative of Dorylus, being the male of Typhlopone; and as the latter genus, or one very closely resembling it, had been received from Brazil from Mr. Bates, the communication, should the connexion therein stated prove eventually to be correct, certainly confirmed Mr. Shuckard's views.

Mr. Stainton read the following paper:—

On the persistence of Species.

"Some strangely heretical notions were broached at the last Meeting,—at least they were such notions as must appear heretical to all who have closely studied species.

"It was suggested that those individuals of a genus which all who have most carefully investigated the subject agree in considering *species*, were not in reality *species*, but merely varieties, or rather races caused by some modification of habit. The statement that different species will, in the larva state, feed on different plants, was used in an inverted manner to imply that eggs of one species laid on four or five different plants will produce apparently as many different species.

"I do not wish in the slightest degree to overstate the new theory, but I cannot see that it differs in degree from what I have just mentioned. Species somewhat similar feeding on closely allied plants were suggested as probable variations caused by the difference of food; but if a slight difference of food causes a slight apparent difference of species, a greater difference of food would of course produce a greater apparent difference of species, and thus each genus might be assumed to consist of only a single species, varying according to its food and other circumstances.

"Hence species *are* not; they *were* merely phantoms of the brain of the naturalist.

"The difference between the two specimens of Cemiostoma I have exhibited is not a specific difference; Scitella, driven by stress of weather far from its usual food, laid eggs on Lotus, and thus produced an apparently new species. It is of course an interesting problem whether, if this insect bred from the Lotus were to deposit eggs on an apple-leaf the result would not be some other aberrant creature, which the first captor would hold to be a new species till an elaborate investigation into its pedigree should show that it was descended from Scitella, out of Lotus, by Scitella, out of apple.

"Such theories would never have been started but for the smallness of the objects under discussion.

"I have also brought for exhibition two hitherto reputed distinct species of butterflies, of the genus Vanessa; but as they are very similar in appearance, and feed on plants of the same natural order, Urticaceæ, perhaps the Meeting will now be disposed to consider Polychloros and Urticæ as one species: it will of course be remarked that the flight of these two insects is very different, that of Polychloros being far the more powerful; but then it must be borne in mind that elm trees grow higher than nettles, and consequently a butterfly bred from an elm tree might be expected to be endowed, on that very account, with stronger organs of flight.

"I could multiply similar instances *ad nauseam;* but really I feel that I am un-

necessarily taking up the time of this Meeting, and I should not have recurred to the subject but for the number of young entomologists who now attend our Meetings, on some of whom the idea of gradual developments from one species to another might have most injurious effects, were it not briefly, yet effectually, exploded."

Mr. Westwood considered it would require far greater research than had yet been made, and far more argument than the few lines Mr. Stainton had just read, to disprove the theory he had advanced at the last Meeting, although Mr. Stainton was pleased to imagine he had "effectually exploded" the idea of gradual developments, yet he (Mr. Westwood) still maintained that many of the supposed new species of Micro-Lepidoptera lately established might be merely modifications of other species dependent on diversity of food or other circumstances with which we are not acquainted. That many species of animals, including insects, underwent modifications and became, so to speak, geographical or structural sub-species was well established, as might be seen in Mr. Wollaston's work on "Species," since the publication of which a great change had taken place in the minds, especially of German naturalists, as to the specific rank of many of the supposed species of Carabideous insects, which were now sunk into local sub-species. It was not sufficient to say that larvæ which had fed on the oak, would die rather than feed on any other tree, because the experiment was tried with an individual which had already become quercivorous. Many of the best botanists had also adopted the theory of local sub-species; it was quite necessary to register these permanent or even transitory sub-species, but far more philosophical to endeavour to discover the centre, so to speak, from which they radiated.

Mr. Douglas remarked that in some of the species most closely allied, as, for instance, Cemiostoma Spartifoliella and Laburnella, it was not merely that they fed on different plants, but the habit of the larvæ was totally different, and it would be a preposterous doctrine to maintain that the difference of the habit was the cause of the modification of the species, and not rather that the habit differed because the species were different.

Mr. Dunning said he was no advocate for the notion of species gradually changing from one form to another.

Mr. Stainton observed that Mr. Westwood's remarks went fully the length of maintaining the development theory, and in further illustration of the difference of habits, showing closely allied species to be distinct, he exhibited larvæ of M. Millière's new Coleophora Lugduniella, feeding on Vicia Cracca, and larvæ of C. Vibicella, on Genista tinctoria; the former larva having an ample silken cloak thrown over its black case, and the latter being entirely without the cloak; the former larva eating the leaves through into holes, and the latter blotching the leaves in the usual Coleophoric fashion.

Mr. Vardon called the attention of the Meeting to the lamentable state of the fruit trees in Worcestershire: a few weeks ago they promised one of the finest crops ever seen, which had since been totally destroyed by multitudes of caterpillars, some of which he laid before the Meeting. His own orchards were planted with currant and gooseberry bushes under the fruit trees, and the caterpillars after defoliating the latter, had descended to the former: he would feel much indebted to the members present for any suggestions calculated to remedy or mitigate this serious evil: the crop on at least 1000 acres being totally destroyed.

Mr. Westwood observed, with reference to the statement of Mr. Vardon, as to the wholesale destruction of the apple crop (as well as of that of the currant and gooseberry trees planted under the apples), that the caterpillars which had now proved so destructive for several years were those of the winter moth Cheimatobia brumata, and that as they were now full-grown, the mischief which they had produced had arrived at its height for the present year. The destruction of such of the caterpillars which still remained in the trees by beating the branches over large sheets, and which had already been practised to a large extent, was still highly desirable; but Mr. Westwood considered that the peculiarities of the perfect insect offered much greater facilities for preserving the crop of next year. The habit of the caterpillar to descend to the ground and undergo its transformations in the earth, together with the fact that the female being wingless, would only be enabled to lay her eggs upon the tips of the present year's shoots (so as to allow the newly hatched larvæ to find an immediate supply of food) by creeping up the trunks of the trees, suggested what appeared to be a satisfactory means of combatting this pest. The German horticulturists had indeed invented a kind of boot or box for the protection of the base of the trunk of the tree, composed of four upright boards fixed close round the tree, each having a small oblique ridge at the top, the inner surface which was kept (during the months of October and November when the perfect insects appear) moistened with gas tar or other sticking matter, which caught the females as they endeavoured to ascend the trees. It would also be very advisable at the same period of the year, either to remove and burn the earth beneath the trees to the depth of several inches, in order to carry away and destroy the chrysalids, or to beat the surface hard so as to prevent the moths making their escape to the open air. Children might also easily be trained to watch for and destroy the females when they make their appearance. They, however, rapidly ascend the trees so that much vigilance is required. It had been asked whether it would not be advisable to destroy the apple trees in order to save the gooseberry and currant trees beneath, but this appeared a proceeding very doubtful of success, as the insects certainly first attacked the apples, and the destruction of the latter would only increase their attacks on the other trees.

Mr. W. W. Saunders read "Descriptions of some new species of the genus Erycina."

July 7, 1858.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors: — 'Proceedings of the Royal Society,' Vol. ix., No. 31; presented by the Society. 'The Zoologist' for July; by the Editor. 'Exotic Butterflies,' Part 27; by W. W. Saunders, Esq. 'Bulletins de l'Academie Royale des Sciences, des Lettres et des Beaux Arts de Belgique,' 2me Série, Tomes i., ii. et iii.; 'Mémoires Couronnés,' Tome vii.; by the Academy. 'The Classed Catalogue of the Educational Division of the South Kensington Museum'; by the Committee. 'The Literary Gazette' for June; by the Editor. 'The Athenæum' for June; by the Editor.

'The Journal of the Society of Arts;' by the Society. 'A Manual of British Butterflies and Moths,' No. 18; 'The Entomologist's Weekly Intelligencer,' Nos. 89, 90, 91 and 92; by H. T. Stainton, Esq.

Exhibitions.

Mr. Smith exhibited some insects of various orders collected at Sierra Leone by Mr. Foxcroft, upon which Mr. Adam White communicated the following notes:—

Anthocharis Evippe, male and female.

Philognoma Varanes. Found in West Africa as well as South Africa.

Romaleosoma Ceres. A genus of many species, of sombre and yet not unhandsome butterflies, peculiar to West Africa.

The large black Hesperia (*Mars. ?*) and two or three other interesting species may be specified.

Pontia Narica. Connecting Pontia with Leucophasia.

Myrina Alcides or an allied species. It would be very valuable to ascertain the transformations of this fine butterfly and of the allied genus Iolaus.

Acræa Circeis, Westw. There are several species of Acræa in this little collection; Acræa Euryta, *var.*, with its spined chrysalis, and Acræa Quirina, a lovely species.

The sugar-cane Nonagria, very like the one figured by Landsdown Guilding, from the West Indies.

Of Sphingidæ, Daphnis Nerii, so widely distributed, and Acherontia Atropos, whose food-plants are also widely spread, may be specified.

The fig-tree feeder is one of the most interesting moths in the collection; it belongs to the same group as Cossus and Zeuzera, and may prove a genus allied to Langsdorfia from Brazil and Cossodes from King George's Sound.

Massaga Hesparia, Walker, Cat. Lep. Het. in Brit. Mus., pt. 2, p. 358. (*Phalæna Hesparia*, Cram. Pap. Exot. i. p. 87, pl. 56, f. C).

We have an imperfect specimen of this in the British Museum from Sierra Leone, where it was found by the Rev. D. F. Morgan. Cramer published it as from Demerara, but Morgan's, and again Foxcroft's capture of it as well as its affinities, show that Sierra Leone is its real habitat.

Thyridopteryx Sierricola, White. *Male.* Antennis subfuscis pallidulis, alis hyalinis, argenteo-nitidis, anticis ad basin plagâ atrâ longi-squamulatâ, thorace lanâ albâ sericeâ longâ induto. *Hab.*—Sierra Leone.

An interesting member of a genus which doubtless abounds in species. Mr. Westwood's monographs of these "Arcana" will require shortly a new edition. This should be figured with its chrysalis, cocoon, &c.

Of Orthoptera, there may be specified a curious Hymenotes with its Membracis-like aspect, a very interesting Mantidous insect allied to one described by Westwood.

Of Coleoptera there are several species, some of which are Myrmecophilous and Staphylinidous.

Of Geodephaga, an Acanthogenius, and a Cicindela, allied to nitidula.

Of Lamellicorns (and the Cetoniadous family in particular) may be specified Plæsiorhina recurva (*Fabr.*), *Schaum.*; Pachnoda fimbriata (*Gory & Perch*), *Burm.*—perhaps only a variety of P. olivacea; Pachnoda marginella.

Of Longicorns, the Mallodon and Hammaticherus, with their transformations, are interesting.

Of Neuroptera, the male Termes is worthy of notice.

And lastly, of the Spiders; there is the large Nephila, belonging to the same group as our garden Epeira Diadema, and which makes very thick silken ropes, which the late Mr. Whitfield once told Mr. White were so strong, that in the forest the wanderer must take care of his face, as he might, if careless, be hurt by coming against them.

Mr. Smith also exhibited some interesting nests of Hymenoptera sent by Mr. Foxcroft from Sierra Leone, amongst which was that of a species of Vespa, formed of a perfectly white material; and a leaf from the same locality covered with small purse-shaped galls, from which a minute black species of Thrips had been bred.

Mr. Westwood observed that although the species of Thrips were certainly insectivorous, yet that certain species were well known as being amongst the greatest pests to the horticulturist, puncturing the leaves of melon, cucumber and other greenhouse plants; the discovery that any species of this group formed galls was certainly quite a new fact, although from the great analogy with the Aphides, it was not improbable that they might be gallicolous, in the same way as certain Aphidæ forming the genus Byrsocrypta.

Mr. Walker also suggested that it was not improbable that the small finger-like galls found so constantly on lime-tree leaves, and of which he had never observed the inhabitants, were also the production of Thrips.

Mr. Westwood, in reference to the exhibition by Mr. Janson, at the preceding Meeting, of a minute species of Heteropterous Hemiptera found in ants'- nests, now exhibited the type specimen of his Microphysa pselaphiformis, together with a specimen of Microphysa myrmecobia of Germar, which last was identical with Mr. Janson's insect, although it was certainly not congenerical with the British type of the genus, which had abbreviated elytra, whereas they entirely cover the abdomen in M. myrmecobia, although destitute of an apical membrane.

Mr. Stevens exhibited a small box of insects sent home by Mr. Shield from Bahia.

Mr. Stainton exhibited some leaves mined by the larvæ of Nepticulæ also sent from Bahia by Mr. Shield, and being the first tropical examples ever brought to this country.

Mr. Stainton also exhibited specimens of Anthrocera Minos found on the west coast of Scotland; and the larvæ of Cemiostoma lotella, mining the leaves of Lotus major, in which they had been found in some plenty by Mr. T. Wilkinson.

Mr. Westwood would take this opportunity of correcting the erroneous view which Mr. Stainton had taken of the remarks made by him on specific differences, at the last Meeting, asserting in the report of the Meeting published in 'The Entomologist's Weekly Intelligencer,' p. 95, that they went fully the length of maintaining the development theory,—that is, the theory advocated by the Lamarckian and 'Vestiges of Creation' schools, that an animal in a series of ages is able to develope itself into a totally different kind of creature; that a mouse, for instance, anxious to fly, is able after a long series of generations to acquire wings like a bat. Mr. Westwood, on the contrary, affirmed the identity and permanence of species, but insisted not only on the possibility of the modification of individuals composing the species, but also on the

permanence of such modifications of specific forms through several or even many generations, so long, in fact, as the disturbing influences which produced the modification remained at work. It was by this kind of radiation from a central specific type that geographical varieties were produced and perpetuated; and thus, for instance, Mr. Westwood was induced to regard all the species of Ornithoptera allied to O. Priamus, recently proposed by himself and others, as modified sub-species or local varieties of that insect. So also were produced by the agency of man himself the different varieties of the silk-worm, so well known in the "magnaneries" of the South of France and Italy. He believed that if many of the Micro-Lepidoptera regarded by Mr. Stainton as distinct species were really such, they would exhibit tangible structural modifications in the length and form of the joints of the palpi, the number of joints in the antennæ, the structure of the veins of the wings, or of the tarsi. Mr. Stainton had, however, failed in describing any such characteristic modifications.

Mr. Stainton observed that he should consider that such differences as Mr. Westwood alluded to would be *generic*, not *specific*.

Dr. Gray maintained the existence of permanent and geographical varieties in all classes of animals, from Mammalia downwards.

Mr. Stevens exhibited a few insects collected in Madagascar by Madame Pfeiffer, amongst which was a fine species of Calandra.

Mr. Mitford exhibited a beautiful Noctua (*Brana calopasa*) from Ceylon, and gave the following interesting account of the habits of the species, communicated by E. L. Mitford, Esq.:—"One morning in March, about seven o'clock, I saw a cloud of these moths whirling and sporting round the trunk of a large tree. After continuing their gyrations for half an hour, they gradually settled in a large patch on the shady side of the tree, forming a sort of thatch, the wings of one row overlapping the bodies of the next, when they appeared like an excrescence on the bark, which they resembled in colour: this habit is very peculiar to this moth, as it is very uncommon for moths to go in swarms."

Cells of the Honey Bee.

Mr. Tegetmeier stated that he had recently made some experiments with a view of ascertaining whether the cells of the hive-bee were formed hexagonally, or whether such form was the result of lateral pressure, or rather the natural result of placing cells close together without any loss of space; with this object in view he had placed pieces of wax on the bars of one of "Wildman's" hives and watched the bees commence excavating therein; the cells formed, invariably proved cylindrical. They were, however, not in juxtaposition, as in the normal comb.

Mr. Tegetmeier also expressed his conviction that the cells of bees were also formed in the first instance with a hemispherical base, having observed the deposition of the foundations of numbers of cells on the under side of one of the bars of his leaf-hive, which he had removed shortly after the swarm had been hived into it; and also that the outer portion of each cell was also cylindrical until a fresh cell was added on its outer side, when the cell became an inner one, and its outer sides transformed into an hexagon.

Dr. Gray contended that the hexagonal form was undoubtedly the result of lateral pressure, if cylinders composed of any yielding substance (vermicelli for example) were placed side by side and subjected to such pressure, they were invariably forced into the hexagonal form; he considered the attempt made by Natural Theologians to prove that the formation of an hexagonal rather than a cylindrical cell indicated

the possession of a greater degree of Divine wisdom bestowed on the insect, was the greatest piece of humbug they had ever brought forward.

Mr. Smith had tried the experiment with cylinders formed of paper pasted together, but failed in producing the result stated by Dr. Gray; he was not prepared to argue or to express any opinion upon the formation of the cells of the hive-bee, but he was prepared to show that the common wasp (*Vespa vulgaris*) constructed her hexagonal cells upon as predetermined a plan as a mason would build a stack of hexagonal chimnies. When the wasp commences the construction of her nest, having found or formed a suitable cavity, she begins by making three circular saucer-shaped receptacles, in each of which she deposits an egg; she then proceeds to form other similar shaped receptacles, until the eggs first deposited are hatched and the young grubs require a share of her attention. From the circular bases she now begins to raise her hexagonal cells — not building them up at once, but from time to time raising them as the young grubs grow: this is all effected by the mother-wasp, unassisted by a single worker; and it must be borne in mind, that she works with no plastic material like wax, and that the hexagonal cells are built, course by course, like layers of brickwork. There was fortunately in a box upon the table a specimen of a small nest of a Brazilian wasp, (*Polybia*): these wasps construct in the first place a comb of hexagonal cells, having, like that of the common wasp, circular bases; over the first comb they construct a flat covering or roof, and by this time the grubs are all full-fed and the cells closed in; the wasps now commence a second comb, and the flat roof serves as the foundation to build upon: they form no cup-shaped bases, but build up the walls of the hexagons as regularly as a mason would erect hexagonal chimneys; in some instances, as might be seen in the nest before the Meeting, only the foundation of the first plane of the hexagon is laid down, in another case two, in another three, and so on; but that wasps ever build cylinders, which afterwards become hexagons, in Mr. Smith's opinion, has no foundation in fact.

Mr. Tegetmeier added that he did not consider his experiments as conclusive evidence on the subject; he intended to repeat them and to ascertain, if possible, what use was made of the wax taken from the excavations formed in the pieces of wax which he provided to the bees, and, with that object in view, proposed to colour the wax with Alkanet root before placing it on the bars of the hive.

Mr. Tegetmeier exhibited to the Meeting a new observatory hive which he had lately constructed, having the sides each composed of three plates of glass placed about a quarter of an inch apart, and each made perfectly air-tight at the junction with the frame; by this contrivance he considered a nearly uniform temperature would be maintained in the hive despite external atmospheric changes.

Part 8 of the current volume of the Society's 'Transactions' was on the table.

August 2, 1858.

J. O. Westwood, Esq., V.-P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'The Natural History Review,' Vol. v. No. 3; presented by the Dublin

University Zoological Association. 'The Zoologist' for August; by the Editor. 'A Manual of British Butterflies and Moths,' No. 19; 'The Entomologist's Weekly Intelligencer,' Nos. 93—96; by H. T. Stainton, Esq. 'The Literary Gazette' for July; by the Editor. 'The Journal of the Society of Arts' for July; by the Editor. Four specimens of Laverva phragmitella; by A. F. Sealy, Esq.

Election of a Member.

George Fenning, Esq., of Lloyd's, London, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. Knaggs exhibited a box of beautiful Lepidoptera and other orders of insects from Demerara.

Mr. Waring exhibited a fine male specimen of Notodonta bicolora, a species hitherto unrecorded as British, taken by Mr. Bouchard, in July last, near Killarney.

Mr. Hunter exhibited fine specimens of Trochilium Chrysidiformis and Spilodes palealis, taken near Folkestone.

Dr. Wallace exhibited the following insects, taken in the Isle of Wight this season, *viz.*, Micra ostrina (two specimens), a species hitherto recorded as British on the authority of a single example, taken many years since, by the late Captain Blomer, near Bideford; fine specimens of Spilodes silacealis; a Nola, apparently distinct from the known British species; and a fine series (including both sexes) of Phibalapteryx gemmaria, amongst which, he observed, were specimens similar to those recently recorded in this country as P. fluviata.

Mr. Westwood read a letter from Herr Nietner, received by Mr. Spence, recording the discovery, in Ceylon, of a Strepsipterous insect, parasitic on an ant. Mr. Westwood exhibited drawings, and read a description of the species, drawn up from the mutilated examples which accompanied Herr Nietner's letter, proposing for it the name of Myrmecolax Nietneri.

Mr. Walker read a paper on 'Undescribed Neuroptera in the Collection of W. W. Saunders, Esq.'

September 6, 1858.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Stettiner Entomologische Zeitung,' Nos. 4—9; presented by the Entomological Society of Stettin. The 'Zoologist' for September; by the Editor. The 'Journal of the Royal Agricultural Society of England,' Vol. xix. Part 1; by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. iii. No. 9; by the Society. 'Catalogue of the Birds in the Museum of the Hon. East India Company,' by Thomas Horsfield, M. and Ph. D., F. R. S., Keeper of the Company's Museum, and Frederic Moore, Assistant; by the Court of Directors. The 'Journal of the Society of Arts' for August; by the Society. The 'Literary Gazette' for August; by the Editor. The Athenæum' for August; by the Editor.

Exhibitions.

Mr. Janson exhibited, on the part of Mr. H. Squire, a box of Coleoptera, collected by him during a visit which he had just made to the Shetland Isles, and remarked, that considering the period of the year at which this trip was undertaken, his short stay of a week only, and the limited district which he had investigated (for the unpropitious state of the weather had precluded him from extending his excursions beyond three miles from Lerwick) the series now before the Meeting must be looked upon as highly satisfactory. The number of species amounts to one hundred and twenty-five, and, although the major portion of them are forms familiar to every London entomologist, still there are among them several to which he would direct the attention of the Meeting.

The first of these is apparently a species altogether new to the British list, the veritable Nebria (Carabus) nivalis of Paykull, which Drs. Kraatz and Schaum have recently shown is not identical with N. Gyllenhalli, *Schomh.*, as had been generally supposed. The specimens now under consideration differ from N. Gyllenhalli (the *ci-devant* nivalis of British collections) in having a smaller thorax, which is more narrowed posteriorly; the striæ on the elytra are much shallowed, and the impressed points or punctures much more evident; and, moreover, the femora are black, the tibiæ and tarsi alone being red.

The second is a Patrobus which does not entirely correspond with the P. excavatus, *Payk.*, *Dawson*, differing in having the thorax shorter and more rounded at the sides and its sculpture coarser; it appears to agree with an insect taken by Mr. Murray in the Clova Mountains, by the Rev. Hamlet Clark in North Wales, and by Dr. Power in Lancashire. Mr. Squire, who has compared it with continental specimens of P. lapponicus, *Chand.*, in the national collection, refers it to that species.

The third is a species of Hydroporus manifestly differing from any at present in our list, and which the Rev. Hamlet Clark considers will, in all probability, prove to be the H. Lapponum of Gyllenhal.

Fourthly, Hydroporus halensis.

Fifthly, Otiorhynchus maurus.

And lastly, an Omalium, which is scarcely referrible to any of the recorded species.

Mr. Stevens exhibited a specimen of Picris Daplidice, taken by Mr. Spencer, near the South Foreland lighthouse, on the 6th of August last.

The Rev. Hamlet Clark exhibited a box of Coleoptera, recently taken by Dr. Power in Lancashire, containing an extensive series of Bembidia, and numerous rare Staphylinidæ, &c.; also a singular monstrosity of Bembidium concinnum, having $2\frac{1}{2}$ tarsi on one of the fore legs; a specimen of Euryporus picipes, taken at Preston Marsh by Mr. Graham; and Hydroporus ferrugineus, also from Lancashire, being a new locality for that rare species. He also exhibited a specimen of Opilus univittatus, *Rossi*, a species hitherto considered peculiar to Italy, which had been sent alive in a pill-box to Mr. Baly, by a lady residing at Malvern.

Mr. Stevens exhibited a small box of insects, sent by Mr. Shield from Monte Video, containing, amongst other minute Coleoptera and Lepidoptera, a singular species allied to Claviger, found in ants' nests, and a Lithocolletis closely allied to L. lautella of Europe.

Mr. Douglas exhibited an apparently new species of Colcophora, found amongst Atriplex, at Seaford, in Sussex; also a small Heterocerus, and a Bryaxis, of which he

had been unable to determine the species, found in the mud under stones in the same locality.

Mr. McLachlan exhibited an Acrobasis, new to Britain, taken at Forest Hill, which Mr. Stainton had pronounced to be A. rubrotibiella of Mann., a species hitherto only found near Vienna: it is closely allied to A. tumidella, though sufficiently distinct, as pointed out by Fischer-von-Röslerstamm in his illustrated work.

Mr. Bond exhibited four fine bred specimens of Carpocapsa saltatans, *Westw.*, with the pupa cases and seeds from which they had emerged.

Mr. Waring exhibited a singular pale variety of Pœcilocampa Populi.

Mr. Adam White exhibited the flat pupa-case of a Cebrionideous genus from North China, and remarked on the vast field of research still open to entomologists in the transformations of Coleoptera. He also communicated the following:—

"Mr F. G. Nicolay, a promising young naturalist, who lately went to St. Salvador, Brazil, sent over, within a week or two of his landing, a box containing the following insects. The list may be not unworthy the notice of the Members, and its publication may encourage youthful entomologists to persevere, and ascend from collecting to observing transformations:—

Papilio Thoas
„ Polydamas
Heliconia Halia
Evides Dianasa
Mechanitis Lysimnia
Agraulis Vanillæ
„ Julia
Danais Gilippus
„ Archippus
Terias tenella
„ Mana
Callidryas Eubule
Ageronia Ferentina
Vanessa Lavinia
Anarta Iatrophæ
„ Amalthea
Heterochroa Cytherea
Argynnis Hegesia?
Didonis Biblis
Polyommatus and three or four Hesperiæ.

Beetles.

Phanæas Jasius (very common)
„ principalis
Cyclocephala melanocephala?"

Mr. Tegetmeier observed it was generally believed that pollen was only used as food for the larvæ of bees, and not by the perfect insects; he had, however, frequently observed bees on the alighting-board of a hive, especially in dull weather, eating the pollen from the legs of their companions as they arrived. He had continued the experiments detailed by him at the July Meeting of the Society, with a view of ascertaining the cause of the hexagonal form of the cells of the hive bee, and found that when excavating in a solid mass of wax they always formed cylinders, but on the sides of the cells approximating they invariably became hexagonal; he considered therefore that the hexagonal form resulted simply from the cells being constructed with a view to the greatest economy of space, and not from any predetermined plan on the part of the bees.

Mr. Lubbock remarked that Mr. Darwin had made similar experiments to those described by Mr. Tegetmeier, with precisely the same results.

Mr. Smith maintained the assertions made by him at the July Meeting that in wasps' nests the cells are constructed of an hexagonal form, and do not acquire it from compression or any other cause. He exhibited the nest formed by the female of Vespa

vulgaris in the spring, as sufficient proof that the hexagonal form was not caused by two insects working at the same time at the formation of adjoining cells, as had been suggested to be the cause with bees; he also exhibited nests of a South American species of Polybia, and of Icaria guttatipennis, in which he observed the outside cells were as angular as those in the centre of the layers of comb, thus proving that the hexagonal form could not, in these instances, result from lateral pressure.

Dr. Gray observed that the theory of lateral pressure certainly was not applicable to the cells of wasps, as they are constructed of a material, which when once hardened never alters its form.

Mr. Downie exhibited a small observatory hive of his own invention, fixed on the top of the stock hive, and a hive, constructed by him, with an improved mode of ventilation.

October 4, 1858.

J. O. Westwood, Esq. V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Bibliotheca Historico-naturalis. Achter Jahrgang, von Ernst A. Zuchold;' presented by the Editor. 'Proceedings of the Zoological Society,' Nos. 350 to 362; by the Society. 'Proceedings of the Royal Society,' No. 32; by the Society. 'Mémoires d' Entomologie publiées par la Société Entomologique des Pays-bas, Livraisons,' 4, 5 and 6; by the Society. 'The Journal of the Society of Arts' for September; by the Society. 'The Zoologist' for October; by the Editor. 'The Literary Gazette' for September; by the Editor. 'The Athenæum' for September; by the Editor. 'The Natural History of the Tineina,' Vol. iii.; 'Manual of British Moths and Butterflies,' Nos. 20 and 21; 'The Entomologist's Weekly Intelligencer' for 1858; the same, No. 105; by H. T. Stainton, Esq. 'Monographie des Elaterides,' par M. E. Candize, Tome Premier; by the Author.

Election of Members.

R. H. Mitford, Esq., of Haverstock Place, Hampstead, was ballotted for and elected a Member; and W. H. Allchin, Esq., 7, Pembridge Villas, Bayswater, a Subscriber to the Society.

Exhibitions.

Mr. Stainton exhibited, on behalf of Mr. Boyd, some of the latter gentleman's most interesting captures in Cornwall this summer, interesting not merely as species new to our lists, but from the fact that some of these insects had only hitherto been found in the Mediterranean or at Madeira. The principal species exhibited were

1. *Diasemia Ramburialis*, of which Mr. Boyd had only taken a single specimen; this species was first detected in the Island of Corsica.

2. *Gelechia leucomelanella*, a conspicuous black and white species, hitherto known only as a native of Central Europe, bred from Silene maritima.

3. *Gelechia Cornubiæ*, n. s. (or a variety of Solutella); this was not scarce among the Cornish heath (*Erica vagans*).

4. *Gelechia Ocellatella*, n. s., bred from Beta maritima; this species had been obtained in Madeira by Mr. Wollaston.

5. *Glyphipteryx schœnicolella*, n. s., allied to G. oculatella; these were bred from the heads of Schœnus nigricans.

6. A series of *Elachista triseriatella* and *dispunctella*, clearly showing that those two species were merely forms of one and the same.

Mr. A. F. Sheppard exhibited, on behalf of Mr. C. S. Gregson, specimens of Peronea Potentillana, *Cooke*, recently described as a distinct species in the 'Zoologist'; Mr. Sheppard expressed his opinion that the insects in question were varieties of P. Schalleriana.

Mr. Edleston sent for exhibition a series of specimens, from which it was evident that the so-called species is a mere variety.

Mr. Stevens exhibited some beautiful butterflies taken by Mr. Wallace in Celebes, amongst which were both sexes of Ornithoptera Remus and O. Haliphron, Papilio Androcles, and two undescribed species of that genus, some fine Pieridæ, &c.

Mr. Bond exhibited two bred specimens of Xanthia gilvago, and an example of Agrotis saucia, in most perfect condition, which was infested by hundreds of a small Acarus, of a species unknown to the Members present.

Dr. Knaggs exhibited some Noctuæ, &c. lately taken at Camden Town, observing that the occurrence of such species close to the metropolis was interesting; they included Agrotis saucia, A. corticea, and A. ravida, Gortyna micacea, Endorea Cembræ, &c.; he also exhibited some larvæ of a species of Dynastes, from Demerara, preserved in spirits, and a small female of a Termes from the same locality.

Mr. Stevens stated that he has recently been informed by a letter from Mr. H. W. Bates, that the small pale Scarites taken by him on the Amazons, and briefly characterized by Mr. Westwood, at the February Meeting of the Society, by the name of Solenogenys fæda, was an inhabitant of the nests of white ants.

Mr. Robinson exhibited specimens of Lamophlæus Clematidis, found in the stems of the Clematis Vitalba, near Gravesend.

Mr. Piffard exhibited a collection of insects, consisting chiefly of Coleoptera and Lepidoptera, which he had recently made in Nova Scotia and the vicinity of Demerara River.

Memoirs of the Entomological Society of the Netherlands.

Mr. Westwood called attention to the recently published 'Memoirs of the Entomological Society of the Netherlands,' as containing many beautiful figures and valuable papers; he observed that the long illness and subsequent death of Dr. De Haan had caused the collections at the Leyden Museum to be much neglected; he was, however, happy to say that his successor, Mr. S. C. Snellen van Vollenhoven, was going energetically to work, and had recently shown him some excellent drawings intended to illustrate the work before him. The Leyden Museum was particularly rich in the insects of the Indian islands, such as the industry of Mr. Wallace was now adding to our British collections.

Mr. Westwood added that the drawers containing the larger Lepidoptera in the collection alluded to were constructed with glass bottoms, the insects being pinned to narrow slips of cork affixed thereto; this plan obviated the necessity of taking out the specimens to examine the under side, as to do so it was only necessary to turn the drawer upside down.

Bees Feeding on Pollen.

Mr. Tegetmeier stated that with a view to prove more satisfactorily that bees devoured pollen in their perfect state, he had driven the stocks from two ordinary

straw hives into one of his bee hives, placing in the box above it some old comb filled with pollen, which was speedily eaten by the bees, although as there was a quantity of syrup in the food-pan, they were certainly not driven to devour it from hunger: he exhibited the empty comb to the Meeting, observing that the only mention made by any writer on bees of pollen being eaten by the perfect insects was in 'Kirby and Spence's Introduction to Entomology.'

Mr. Tegetmeier added that Mr. Darwin has lately coloured the margin of some cells in the course of construction, and found that the bees remasticated the coloured wax and used it in the formation of the cells, thus proving that they can work up old material.

Cylindrical forms of Cells.

Mr. Smith observed that the theory advanced by Mr. Waterhouse in the 'Penny Cyclopædia,' of the bees first making cylindrical excavations, only separated from each other by the thickness of the walls of the intended hexagons at their points of contact, certainly in his opinion, would render it absolutely necessary that the bee, or wasp working, should be able to insert its head into the excavations, otherwise, how could they possibly form the planes of the hexagons? Now, that such could not be the case in building the cells of the wasp, he was prepared to prove. Mr. Smith exhibited the spring nest of Vespa vulgaris, in which the mother-wasp had constructed about thirty cells, seven only being carried up to their full height, which contained each a grub or a pupa, so that no worker had escaped; the cells being of such a size that by no possibility could the head of the builder be inserted into them; this, he contended, was in his mind decisive against the theory alluded to, at least it was not applicable to the building of the nests of the Vespidæ.

Mr. Smith also called particular attention to a singular fact, namely, that in the nest of the wasp the smallest cells were built in the spring nests by the largest individual, the female; whilst the largest cells, those required for the females and males, were built in the summer by the smallest individuals, the workers; now, as he understood the Waterhousian theory, the size of the planes of the hexagon, were determined by the distance the insects excavating could reach with its mandibles, if such were the case, how was it possible to reconcile the above facts with the theory of the 'Penny Cyclopædia.'

Mr. Westwood could not imagine how the female wasp constructed the beautiful little nest before the Meeting without inserting her head into the cells, but it evidently was quite impossible for the insect to do so, as stated by Mr. Smith.

November 1, 1858.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Annales de la Société Linnéenne de Lyon,' Tomes iii. and iv.; presented by the Société Linnéenne de Lyon. 'Annales des Sciences Physiques et

naturelles, d'Agriculture et d'Industrie, publiées par la Société imperiale d'Agriculture, &c. de Lyon,' 2ième Serie, Tome viii., 3ième Serie, Tome i.; by the Society. 'Mémoires de l'Académie impériale des Sciences, Belles-lettres et Arts de Lyon.' Classe des Lettres, Tomes v. and vi.; Classe des Sciences, Tomes vi. and vii.; by the Society. 'Verhandlungen des zoologisch-botanischen in Wien,' Vol. vii.; also 'Personen-Orts und Sach Register der fünf usten Jahrgänge der Sitzungsberichte und Abhandlungen;' by the Society. 'Proceedings of the Literary and Philosophical Society of Liverpool,' No. 12; by the Society. 'Exotic Butterflies,' Part 28; by W. W. Saunders, Esq. 'List of Specimens of Lepidopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., &c., Part xv. Noctuidæ; by the Author. The 'Zoologist' for November; by the Editor. The 'Literary Gazette' for October; by the Editor. The 'Journal of the Society of Arts;' by the Editor. A 'Manual of British Butterflies and Moths,' No. 22; The 'Entomologist's Weekly Intelligencer' for October; by H. T. Stainton, Esq. Six specimens of Agrotis saucia; by F. Bond, Esq.

Election of a Member.

Robert Slade, Esq., of 36, Gillingham Street, Pimlico, was balloted for and elected a member of the Society.

Exhibitions.

Mr. Stainton exhibited a specimen of a new British Noctua, Micra parva, taken at Torquay by Dr. Battersby: that gentleman had made a careful investigation of the cliffs at Torquay, in June last, in consequence of his daughter having met with a specimen of Micra ostrina, and the result was several more specimens of M. ostrina, and with them two M. parva, which he at first mistook for small females of M. ostrina: "they lay very close amongst the grass and brambles, and when disturbed did not fly more than a yard or two."

Mr. Gorham exhibited the living larvæ of Coleophora Virgaureæ, from Westerham, Kent.

Mr. Westwood exhibited beautiful examples of Acherontia Atropos and Sphinx Convolvuli, and remarked on the usefulness of setting out the legs of specimens of Lepidoptera, which has hitherto been much neglected by entomologists in this county.

Mr. Smith exhibited, on behalf of Mr. Plant, the following Coleoptera, *viz*:—Tropiderus sepicola, from Buddon Wood; Zeugophora flavicollis, from Martinshaw Wood, Lincolnshire; and Orsodacna humeralis, captured in Birkland Forest, Nottinghamshire.

Mr. Stevens exhibited some fine Coleoptera, taken by Mr. A. R. Wallace in Celebes.

Mr. Westwood exhibited an ant, from South America, destitute of eyes; the specimen had been obtained by him on his recent visit to Denmark. Mr. Smith believed the insect pertained to the genus Eciton.

Mr. Bond exhibited, on behalf of Mr. A. F. Sealy, two specimens of Luperina Dumerilii, taken in the South of England during the past season.

Mr. Stevens read some extracts from a letter received from Mr. Diggles, of Moreton Bay, on the Entomology of that part of Australia, and stated that he had received a letter from M. Mouhot, who had undertaken a journey to Siam in quest of

objects of Natural History, announcing his arrival at Singapore in September last.

Mr. Wilkins observed that he had lately had a female of Acherontia Atropos brought to him, which, on being placed under a tumbler, had deposited eggs; it was usually considered that the autumnal specimens of this and other allied species were invariably barren.

Mr. Dutton had lately obtained a female of Acherontia Atropos which contained no ova.

December 7, 1858.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Bulletin de la Société Impériale des Naturalistes de Moscou,' Année 1857, Nos. 2—4; 1858, No. 1; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. iii., No. 10; by the Society. The 'Natural History Review,' Vol. v., No. 4; by the Dublin University Zoological Association. The 'Zoologist' for December; by the Editor. The 'Athenæum' for November; by the Editor. The 'Literary Gazette' for November; by the Editor. The 'Journal of the Society of Arts' for November; by the Society. A 'Manual of British Butterflies and Moths,' No. 23; The 'Entomologist's Weekly Intelligencer,' Nos. 110—114; by H. T. Stainton, Esq. 'Description de diverses espèces nouvelles ou peu connues des Genre Scolia' par H. de Saussure; by the Author.

Exhibitions.

Mr. Stevens exhibited a box of minute Coleoptera, chiefly Staphylinidæ, sent by Mr. Wallace from Celebes, amongst which were several species of Philonthi and Steni. He observed that he was informed by Mr. Wallace that the Staphylinidæ were no doubt as numerous in the tropics as in more temperate regions, if assiduously searched for.

Mr. Stevens also exhibited two fine longicorn beetles, Phosphorus angulator and Tragocephala pulchella, from Sierra Leone.

Mr. Bond exhibited a specimen of Acherontia Atropos, having the markings of both the anterior and posterior wings on the right side much more suffused than usual.

Dr. Wallace exhibited a box of Lepidoptera taken in the Isle of Wight during the past summer: it contained a fine specimen of Catephia alchymista, a Noctua new to Britain, taken in September last; a specimen of Laphygma exigua, attracted by light, also in September; Heliothis armigera; Leucania vitellina; specimens of Micra ostrina, taken in June and August, and an example of Nola centonalis, attracted by light the first week in July.

Mr. Smith exhibited some beech leaves from Fontainebleau Forest, infested by galls formed by Cecidomyia Fagi: he observed that the species was mentioned by Mr. Walker in the third volume of the 'Insecta Britannica,' p. 131, as found on beech trees in Switzerland, &c.

Mr. Smith also exhibited specimens of Ponera contracta, found by Mr. Squire in a bakehouse near Burton Crescent.

Mr. Westwood observed that the first recorded British example of this species was found by him in St. James's Park.

Mr. Westwood exhibited a specimen of Solpuga fatalis, a large and very poisonous spider from India.

Mr. Westwood stated that the binding of the books in the library of a lady residing at Oxford had lately been found to be much injured by a Lepidopterous larva, apparently that of Endrosis fenestrella.

The Secretary read the following, from a letter addressed by Mr. H. W. Bates to Mr. Stevens:—

"Ega, September 29th, 1858.

"The two species of Cymindis you mention as interesting things contained in my last collection were taken under extraordinary circumstances, which I think are wotth relating, although there is nothing of scientific importance connected with the subject. One only is a Cymindis, the largest of eight or ten species: I have found all but this one about roots of herbage in sandy, partly sheltered places; the other metallic species, so similar to the Cymindis in its rufous square humeral patch, is really a Coptodera or new genus allied thereto,—all the allied species of which, at least twenty taken here, are found coursing over the bark of decaying trees. These two species, however, were not taken in their proper habitats, but cast ashore on the sandy beach near the town after a stormy night on the lake. I found them together with vast multitudes of other insects; in fact, there was a ridge of sediment along the beach, a mile in length, composed almost entirely of insects. It is remarkable that a great number of the species I have never been able to obtain in any other manner. The causes of the phenomenon I suppose to be these,—premising that it occurs only once annually, at the end of August, during stormy, changeable weather, which follows the first heats of the fine season: — a sultry night attracts vast numbers of nocturnal insects from the forest to fly about over the lake; a squall of cool wind arrives suddenly from the opposite shores, and the wind and chilled temperature cast the myriads of gambolling insects into the water, the swell afterwards casting them on the beach. It is a proof of the vast number of the nocturnal insects in the tropics. The greater proportion consists of Coleoptera; there are also many Hemiptera and moths; even small birds, Cerabæ and others.

"The Coleoptera consist chiefly of vast numbers of Scaritidæ, from minute species less than the Dyschirius gibbus of Europe to large Scarites, 1½ inch long; some of them of very singular forms, such as Oxystomus, Stratiotes, and some, I think, new genera; the most remarkable of which Mr. Westwood has recently described as Solenogenys fœda. There are also many Truncatipennes, chiefly of genera Polystichus, Zuphium, Diaphorus, Galerita, Casnonia and Brachinus. Other Geodephaga are in less variety, but some species, as a species of Dercylus, are in vast multitudes. Next in numbers to the Scaritides are the Heteromera, chiefly small species allied to Helops. After them come the Lamellicornes; grand Dynastes—the Megalosomæ, Mars and Actæon, Enema infundibulum, species of Stratœgus, Cælosis, Ligyrus, Stenocrates, Chalepus and Cyclocephala. Some black species of Chalepus and Stenocrates especially occur always by thousands. There are also a few Melolonthidæ,

of the genus Microcranium (*Burm.*). Amongst the sediment I found also one or two large handsome Buprestidæ. Staphylini occur in less abundance, although there are great numbers of minute species clinging to portions of wood, and a few very large species, as Pinophilus torosus, *Er.*, a very large Staphylinidi. The Pselaphidæ are also in vast numbers, clustering within the crevices of pieces of wood and rubbish cast up by the waters. I could only find time to select a few of the more curious species; one was a minute Articerus, some others belonged evidently to genera at present unknown. There were many other large Coleoptera, of which only single specimens occured, such as two very fine Prionidæ, one, I think, a Mecosarthron. Numbers of a Macraspis also occurred,—a genus which I thought were exclusively day-flyers, and it was a species which I had not yet taken in its place in the forest. There were also many Coccinellæ; two Cantharides which I have never been able to meet with elsewhere; several Anthici, Curculionides, Cassidæ and other families of Coleoptera.

"There are a few Hymenoptera, ants and one or two bees and wasps.

"The Hemiptera were chiefly two or three species of Pachycoridæ, very handsome insects, especially one, an Angocoris, but these were rare, whilst a species of Canthecona was in great abundance.

"The greater part of the insects thus cast up by the waters of the lake were quite dead, others nearly so, whilst many clinging to portions of wood and weeds were alive: two or three hours of an equatorial sun soon dispersed the latter: of the former, the large-bodied Lamellicornes became a prey to flocks of insectivorous birds, especially bands of little sandpipers; they ate only the abdomen: the Carabides and Hemiptera they would not touch; many of them remained entire for many days, others fell to fragments after being exposed to the sun. The waters of the rivers at this season were retreating, but the fragments of insects were covered by a stratum of blown sand, and this may serve to explain the method by which masses of the bodies and mutilated remains of insects become imbedded in fossiliferous strata.

"This wholesale destruction of insect life does not occur frequently; in fact, I have witnessed it on a large scale only once a year. On many sultry evenings, in the fine season, numbers of insects are to be seen flying abroad, but the various conditions required for the grand immolation do not combine frequently. I have found many interesting Coleopterous insects by standing in a favorable place on the banks of the river, and observing them as they pass; it is necessary to have the clear western sky in the background. The insects are very uncertain in their appearance; it is not even every sultry night that proves favorable; they appear to be acted upon by atmospheric conditions which we cannot ourselves appreciate or calculate. Many of the insects taken flying in this way are the same as those found drowned on the beach, as related above, especially the Scaritidæ, the Polystichi, Heteromera, &c.; but many others are different,—for instance, many small Longicornes, especially Chrysoprasis, are eminently day-insects.

"One evening on the banks of the Amazons at St. Paulo I witnessed an extraordinary flight of Coleoptera, almost all Scaritidæ; there was literally a shower of them, nearly all the same species—some twenty or thirty—which I had previously found at Ega, on the beach. These insects are extremely difficult to find in their proper habitats; of the thirty or more species of Scaritidæ found flying in the evening, I have not taken more than five or six *in situ*, and those at roots of herbage in shady places. Sometimes these nocturnal insects may be attracted by a lamp at night, placed in a favorable place, but a prolific night rarely occurs; in this way I have taken a great

variety of Pselaphidæ, Scaritidæ, including the Solenogenys fœda; Staphylinidæ, including some extraordinary forms allied to Ophites; also Palpicornes, Calleidæ, even Cicindelæ; numbers of Harpalidæ, genus Selenophorus, but no Longicornes, for many night-flying insects appear not to be attracted by light."

Mr. Stevens stated that Mr. Bates proposed to return to England in the spring of next year, having spent the last eleven years in the investigation of the Entomology of the region of the Amazons.

Mr. Westwood trusted he would receive a hearty welcome from the entomologists of this country, whose collections he had enriched with South-American insects to a far greater extent than had been done by any other individual.

Mr. Stainton read descriptions of twenty-five new species of Indian Micro-Lepidoptera received from Mr. Atkinson, of Calcutta.

Mr. Waterhouse read a paper intituled "Notes on the Species of Elateridæ in the Stephensian Cabinet."

January 3, 1859.

Dr. J. E. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Transactions of the Zoological Society of London,' Vol. iv., Part 5; presented by the Society. 'On the Arrangement of the Cutaneous Muscles of the Larva of Pygæra bucephala,' by John Lubbock, Esq., F.R.S., L.S., G.S., &c.; by the Author. 'Exotic Butterflies,' Part 29; by W. W. Saunders, Esq. 'Monographie des Gomphines,' par Edm. De Selys Longchamps, Membre de l'Académie Royale des Sciences de Belgique et de plusieurs autres Académies et Sociétés Savantes; avec la collaboration de M. le Docteur Hagen, de Koenigsberg; by the Author. 'The Journal of the Royal Dublin Society,' Vol. i.; by the Society. 'Proceedings of the Zoological Society,' Nos. 363—369; by the Society. The 'Zoologist' for January; by the Editor. The 'Athenæum' for December; by the Editor. The 'Literary Gazette' for December; by the Editor. The 'Journal of the Society of Arts' for December; by the Society. The 'Entomologists' Annual' for 1859; 'A Manual of British Butterflies and Moths,' No. 24; The 'Entomologists' Weekly Intelligencer,' Nos. 115—118; by H. T. Stainton, Esq.

Election of a Member.

George S. Mosse, Esq., of Eldon Road, Kensington, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. Waterhouse exhibited a specimen of Tachyusa concolor of Kraatz = Homalota concolor, *Erichs.* The insect was found at the uppermost of the Highgate Ponds, on the 25th of May, 1855. Latterly, Dr. Power has taken the same species at Barnes Common and at the Hammersmith Marshes.

Mr. Waterhouse also exhibited a specimen of Symbiotes latus of Redtenbacher, which he found in sweeping the herbage in a wood near Ryde, in the Isle of Wight, in the summer of 1854 : Mr. Waterhouse believed this was the first occurrence of the genus Symbiotes in England.

Mr. Janson observed that he believed the discovery in Britain of Tachyusa concolor was due to Dr. Power, from whom he had received the species some months back; he had likewise seen it in the collection of Mr. H. Adams; Mr. Squire had also met with it at Hammersmith, and had long since placed it in his cabinet with its legitimate specific appellation.

With respect to Symbiotes latus, *Redt.*, Mr. Janson remarked that he had been for some time past perfectly familiar with it as a British insect. He had first taken it beneath the loose bark of a dead tree, in which a formidable colony of Formica flava had established itself for some years; the beetles were moving about amongst the ants. Redtenbacher says (Faun. Austr. 2nd Ed. 371) that "the species" of this genus, of which he describes two, "live among ants." That Symbiotes latus is not, however, a myrmecophilon, in the strict sense of the term, Mr. Janson stated he had subsequently satisfied himself, as he had found several individuals subsisting on a species of mould growing on a rotten elm stump, more than a mile distant from the spot in which he had first discovered it, and certainly unaccompanied by any ant. Mr. Janson added that Microchondrus (*Guérin*), Wollaston, Ins. Mad, 196 (1854) was coincident with Symbiotes, *Redt.*, and that he should probably have occasion to return to this subject at a future Meeting.

Mr. Stevens exhibited some Coleoptera from the interior of Peru, amongst which were a fine new species of Psalidognathus allied to P. Friendii, and an Agaocephala very distinct from all known species of that genus.

Mr. A. F. Sheppard exhibited some Coleoptera taken at Geelong, Victoria.

Mr. Janson exhibited a specimen of Oxypoda spectabilis, *Maerkel*, Germar, Zeitschr. f. d. Entom. v. 217, 47 (1844); Kraatz. Naturgesch. d. Ins. Deutschl. ii. 162, 2 (1856), taken by Mr. R. Hislop, near Falkirk, during the past season, transmitted him by that gentleman for identification. He remarked that the insect had been first found in Saxony associated with Formica fuliginosa, and was hence considered and described by Herr Maerkel as myrmecophilous, but it was subsequently taken near Berlin, among damp fallen leaves, unaccompanied by ants: the individual exhibited occurred "amongst grass." Dr. Kraatz, *l. c.*, gives it as a distinct species, stating, however, that it appears to him not improbable that it will ultimately prove to be a dark form of O. ruficornis, *Gyll.*, but that a long series of examples was requisite, in order definitely to determine this question. Mr. Janson had carefully compared the present specimen with four individuals of O. ruficornis, *Gyll.*, *Kraatz*, and had been unable to detect any structural distinctions, the only point of disparity being in colour: thus, O. spectabilis has pitchy black antennæ, the three basal joints alone red, the thorax and elytra likewise pitchy black, the humeral angles of the latter rufous. O. ruficornis has the antennæ and lateral margins of the thorax rufous, the elytra rufo-testaceous, with the region of the scutellum dusky.

Mr. Edwin Shepherd exhibited a specimen of Stenus palustris, *Erich.*, a species hitherto unrecorded as British, taken by Mr. F. Bond, in the fens near Cambridge.

Mr. Adam White exhibited a sketch of a curious Isopodous Crustacean, recently sent home by F. M. Rayner, Esq, Surgeon of H.M.S. Herald, and taken by him on

Flinders and Hummock Island; it belongs to the family Sphæromidæ, but is distinguished from every isopod hitherto described or seen by Mr. White, in having a long horny projection from the epistome; the facetted eyes are conspicuous on each side of the same segment; with them is a projecting horn shorter than the middle one. He named it Cephaloniscus Grayanus, in compliment to the keeper of the zoological collections at the British Museum. Mr. White also made some remarks on the order Isopoda.

Mr. Stainton exhibited, on behalf of the Rev. H. A. Pickard, a specimen of Plutella Annulatella, remarkable as having been taken in a new locality, the Isle of Portland, and as being much whiter than ordinary specimens. The only previous localities in this country recorded for this insect, were the North of England (near Newcastle-on-Tyne), the North of Ireland and Scotland; from the greater contrast of colour in this Portland specimen, it was far prettier than the northern form of the species.

Dr. Allchin exhibited a large Noctua allied to Catocala, said to have been taken near Bolton, Lancashire; he had been unable to identify it with any species contained in the extensive general collection of Noctuæ in the British Museum

Mr. Walker made the following remarks:—"At a former Meeting, on the occasion of the exhibition of a horn-shaped gall inhabited by a Thrips, discovered by Mr. Foxcroft, at Sierra Leone, I observed that it resembled the horn-shaped gall of the lime-leaf, and that I had not discovered the insect which is the cause of the latter excrescence; but I have since found that its history has been investigated long ago by the botanist under-mentioned: — 'Observations Physiologiques sur le development des gales corniculées de la feuille de tilleul de Hollande, et sur la cause qui les produit. Par P. J. F. Turpin.' (Mém. Acad. Roy. Sci. Institut. Fr. vi. 1835)." He noticed that it was inhabited by a mite, which he named Sarcoptes Gallarum Tiliæ, and of which he traced the development from the egg to the perfect insect. He observes that it is not certain whether the mite is the cause of the formation of the gall, in which it does not occur before the middle of May nor after the middle of August, and, therefore, its mode of life during nine months of the year is still unknown. Another horn-shaped gall appears on the leaves of the beech, and is quite distinct from the pyramidal gall lately mentioned here as the habitation of Ocidomyia Fagi.

Mr. Smith communicated a paper intituled "A Contribution to the History of Stylops, with an enumeration of such species of Exotic Hymenoptera as have been found to be attacked by these parasites."

Mr. Waterhouse read the following papers: — "A List of the British Species of Latridius." "A Revision of the British Species of Corticaria."

Part ix. of the current volume of the Society's 'Transactions,' published in December, was on the table.

Anniversary Meeting, January 24, 1859.

Dr. Gray, President, in the chair.

Messrs. J. Lubbock, E. Sheppard, H. T. Stainton and G. R. Waterhouse were elected Members of the Council, in the room of Messrs. F. Bond, W. W. Saunders, J. T. Syme and J. O. Westwood. Dr. J. E. Gray was re-elected President; S. Stevens, Esq., Treasurer; and Messrs. E. Shepherd and E. W. Janson, Secretaries.

The Report of the Library and Cabinet Committee and the Treasurer's accounts were read and received; the latter showed a balance in favour of the Society of £266 13*s*. 2*d*.

The President delivered an Address on the affairs of the Society, and the general progress of Entomology, for which the Meeting passed a cordial vote of thanks.

Report of the Library and Cabinet Committee for 1858.

We beg to report that all the typical specimens having been selected from the Society's Collection of Exotic Insects, the remainder was disposed of at public auction in April last, and the sum of £274 9*s*. was realized thereby above all necessary expenses of sale.

In pursuance of the Resolution previously agreed to by the Society, that the proceeds of such sale should be devoted to the purchase of Entomological works wanting in our library, whenever favorable opportunities of doing so might occur, we have to report that the sum of £46 7*s*. was expended at the sale of the late Mr. Heysham's library, in July last, and we have to congratulate the Society on the important additions of standard Entomological works made to our library on that occasion,—in particular we may mention a perfect original copy of Hübner's 'European Lepidoptera.' A further sum of £35 5*s*. has been expended in binding such of our books as most required it, and in preparing a perfect manuscript Catalogue of the entire Library, which we recommend to be printed forthwith, in as compact a form as possible for the use of our members.

The removal of the Exotic Insects from our Cabinets having left the Society most ample accommodation for the collection of British Insects, we have to solicit our members to assist us, not only with specimens of such species as we do not possess, but also in the necessary task of re-arranging the collections.

JOHN EDWARD GRAY.
W. WILSON SAUNDERS.
FRANCIS P. PASCOE.
FREDERICK SMITH.
EDWIN SHEPHERD.

Abstract of the Treasurer's Accounts for 1858.

RECEIPTS.

	£	s.	d.
By Balance on hand, January 1st, 1858	97	14	3½
„ Arrears of Subscriptions	6	6	0
„ Subscriptions for 1858	107	2	0
„ Admission Fees	12	12	0
„ Tea Subscriptions	6	13	0
„ Sale of 'Transactions' at the Rooms £20 18 2			
„ „ „ at Longmans' 18 9 10			
	39	8	0
Cash of Mr. Pascoe for Extra Coloured Plates	2	10	0
„ Mr. Saunders, for Catalogue of Educational Museum Collection	3	3	0
„ Mr. J. C. Stevens' Balance of Sale of Exotic Insects	274	9	0
	£549	17	3½

PAYMENTS.

	£	s.	d.
To paid arrears for 1857:—Mr. Newman, Printing £4 5 0			
Rent to Christmas 20 0 0			
Messrs. Day & Son for Plates 2 10 0			
Mr. Dunn, for Oil 4 13 0			
	31	8	0
„ Rent to Midsummer, 1859	20	0	0
„ Insurance to Lady-day, 1859	2	10	0
„ Curator, for attendance	20	6	0
„ „ Sundry small payments	1	0	11
„ Tea, thirteen Meetings	13	13	0
„ Attendance, Coals, Cleaning, &c.	4	11	5
„ Postage, Parcels, Stationery, &c.	5	0	10½
„ Printing 'Transactions,' four parts	45	8	6
„ Engraving Plates	12	10	0
„ Colouring Do.	37	2	3
„ Arranging and preparing Descriptive Catalogue of Collection presented to the Educational Museum at Kensington	7	2	0
„ Collector's Commission, &c.	0	19	0
„ Books purchased at the Sale of Mr. Heysham's Library	46	7	0
„ Removing Exotic Collection to Sale Rooms	1	8	0
„ Fixing Shelves in Library	1	14	6
„ Bookbinding	20	14	8
„ Preparing Catalogue of Library	11	8	0
	£283	4	1½
Balance in hand	266	13	2
	£549	17	3½

Liabilities and Assets of the Society.

Liabilities.

	£	s.	d.
Mr. Newman, for Printing...	10	4	0
„ Dunn, for Oil	3	10	0
„ Westwood, for Plates ...	3	3	0
„ Yates for ditto	0	13	9
Rent to Christmas	20	0	0
	£57	10	9

Assets.

	£	s.	d.
Arrears of Subscriptions, good	15	15	0
Ditto, doubtful £11 11 0			
Balance in hand	266	13	2
	282	8	2
Less Accounts due at Xmas.	37	10	9
True Balance in favour of the Society.....	£244	17	5

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY OF LONDON, 1859.

February 7, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'An Accentuated List of the British Lepidoptera, with hints on the derivation of the names,' published and presented by the Entomological Societies of Oxford and Cambridge. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., &c., Part xvi., Deltoides; by the Author. 'Journal of the Proceedings of the Linnean Society,' vol. iii. No. 2; by the Society. 'The Zoologist' for February; by the Editor. 'The Journal of the Society of Arts for January; by the Society. 'The Literary Gazette' for January; by the Editor. 'The Athenæum' for January; by the Editor. 'A Manual of British Butterflies and Moths, No. 25; 'The Entomologist's Weekly Intelligencer,' Nos. 119—122; by H. T. Stainton, Esq. 'Proceedings of the Berwickshire Naturalists' Club,' vol. iv. No. 2; by the Club. 'Catalogue of Hispidæ in the Collection of the British Museum,' by Joseph S. Baly, M.E.S., &c., Part I.; by the Author. 'Stettiner Entomologische Zeitung,' Nos. 10—12, for 1858; by the Entomological Society of Stettin.

Nomination of Vice-Presidents.

The President nominated Messrs. F. Smith, H. T. Stainton and G. R. Waterhouse Vice-Presidents for the year.

Election of a Member.

Godfrey Howitt, Esq., M.D. of Melbourne, Victoria, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. Stevens exhibited a box of insects received from Mr. Bates, containing a beautiful series of Micro-Lepidoptera from the Upper Amazon ; and some fine Coleoptera taken by Mr. A. R. Wallace in Amboina, amongst which were Euchirus longimanus, some new and beautiful species of Buprestidæ and Anthribidæ, a magnificent new species of Batocera, and a fine Prionus also new to Science.

Mr. Pascoe has furnished the following diagnoses of two fine longicorns in this Collection :—

Monohammus Grayii. M. aterrimus ; prothorace antice, elytrisque fasciis quatuor, et macula basali hirtis, ochraceis, his chalybeo-atris, nitidis, parce punctatis. Long. 13 lin.

Dixi in hon. J. E. Gray, Ph.D., Ent. Soc. Lond. Præses., &c., &c.

Agnia fasciata.—A. aterrima ; elytris parce punctatis, fasciis quatuor hirtis, ochraceis. Long. 9 lin.

Precedenti facie simillima, sed Agnia, *Newm.*, genus bene distinctum, pertinet.

Mr. Janson exhibited a series of Symbiotes latus, *Redtenbacher* [Faun. Austr. 1st ed. 198, 184 (1849), 2nd ed. 371, 382 (1857), *Gerstaecker*, Mon. Endom. 400, 1 (1858)] illustrating the variations in size and colour to which this species is subject. These specimens were captured by himself, within the London district, on the 30th of June, 14th of July, and on the 8th and 29th of August, 1858, and, as previously stated, in localities upwards of a mile apart. He remarked that he had experienced no difficulty in determining, within a few hours of first meeting with this insect, the genus to which it pertained, the analytical method pursued by Dr. Redtenbacher, in his admirable work above cited, and the clearness and precision of his generic characters, affording peculiar facilities to the student ; but having advanced thus far, *safe* progress was interdicted, for, although Dr. Redtenbacher's description of S. latus satisfactorily applied, in most respects, to the insect before the Meeting, two, apparently important, discrepancies presented themselves, namely, that of his S. latus the author distinctly says that the thorax has "the upper surface *smooth*, shining, *not punctured*," and "the interstices between the striæ of the elytra *not punctured*," whereas, in all the individuals of the insect under consideration, the prothorax is conspicuously, although minutely and sparsely, punctured, and the insterstices of the elytral striæ present numerous irregularly disposed punctures, very evident throughout the basal moiety, but obsolete on the apical half. Under these circumstances he had considered it right to defer bringing the insect before the Society until he had ascertained its legitimate appellation, for which purpose he had intended to transmit specimens to Vienna on the first opportunity which should present itself. In the meanwhile, however, Dr. Gerstaecker's valuable 'Monographie der Familie Endomychidæ,' Berlin, 1858, came to hand, in which the genus Symbiotes is treated, and the species fully described, and at once all doubt as to the identity of our insect and S. latus, *Redt.*, was dispelled. As the present insect so closely resembles in its facies the common Mycetæa hirta, *Marsh.*, *Steph.*, that it may be very pardonably confounded with it (its usually larger size and more parallel elytra might perhaps betray it), the following comparison of the characters of the two nearly

allied genera, jotted down some months back for a friend, may prove acceptable to English students:—

Mycetæa.	Symbiotes.
Antennæ. With the first joint of the triarticulate club very little wider than the preceding (8th).	With the first joint of the triarticulate club conspicuously wider than the preceding (8th), very nearly as wide as the succeeding (10th).
Labrum. Transverse, truncate.	Transverse, slightly emarginate.
Maxillæ. With the two lobes nearly equal in length.	With the inner lobe very short and narrow
Max. Palpi. With the apical joint elongate-ovate, acuminate.	With the apical joint ovate obliquely truncate.
Lab. Palpi. With the second and third joints nearly equal in width.	With the third joint much wider than the second (penultimate), globose.

Mr. Smith exhibited the nest of a species of Larradæ, and that of Sphex Lanierii, *Guérin*, and read the following .—

Observations on two Species of Fossorial Hymenoptera which construct exterior Nests.

"The varied economy of the fossorial division of the aculeate Hymenoptera, equals, if it does not exceed, that of the Mellifera. The name proposed by Mr. Westwood for the former division, "Insectivora," is by far the most characteristic, since all the fossors provision their nests with other insects. As far as my knowledge of the habits of the British species enables me to judge, I believe the majority to be fossorial; some, however, burrow in wood, whilst others avail themselves of ready-formed burrows, &c., adapted to their purposes, never, as far as I have observed, forming tunnels or receptacles for their cells: this appears to be the habit of the species of the Genera Sapyga and Pemphredon.

"Our knowledge of the economy of Exotic species is very limited; I have had the pleasure of bringing before the Society some very interesting observations, made by M. Guenzius at Port Natal, upon various species of Hymenoptera, some belonging to the fossorial division. Mr. Bates has also contributed occasional notices of the habits of various species of these insects. In a collection lately received from the latter gentleman, a nest with the insect which constructed it was received, than which nothing could be more at variance with our preconceived ideas of the habits of the genus to which it belongs: the insect is a species of Larrada; the nest is composed apparently, as Mr. Bates suggests, of the scrapings of the woolly texture of plants; it is attached to a leaf, having a close resemblance to a piece of German tinder or a piece of sponge. With the first nest of this description forwarded by Mr. Bates was received a note, to the effect that he saw the insect issue from it, and he supposed it to be the builder; a second nest has, however, been received with the information that he had now no doubt of the nest being constructed by the Larrada, as he had observed it repeatedly busy in its construction. I have raised the nest from the leaf, and found four or five pupa-cases of a dark brown, thin, brittle consistency.

"I am not aware of any similar habit of building an external nest having been pre-

viously recorded; our British species of the closely-allied genus Tachytes, are burrowers in the ground, particularly in sandy situations; their anterior tarsi are strongly ciliated, the claws bifid and admirably adapted for burrowing. On examining the insect which constructed the nest now exhibited, I find the legs differently armed; the anterior pair are not ciliated, and the claws are simple and slender, clearly indicative of a peculiar habit, differing from its congeners, and how admirably is this illustrated in the nest before us.

"Another nest, also sent by Mr. Bates from Ega, is equally interesting; it is that of a species of Sphex, I believe the Sphex Lanierii of Guérin: this is constructed of a cottony substance, which fills a tunnel formed by a large curled leaf. Here we have another instance of economy at variance with our preconceived notions of the habits of the genus; we have hitherto regarded the species as being pre-eminently fossorial, and upon examing a large number of individuals I find they have the anterior tarsi very strongly ciliated, and all the tibiæ strongly spinose. On examining the Sphex which constructed the nest in the rolled leaf, the anterior tarsi are found to be very slightly ciliated, and the tibiæ almost destitute of spines, thus affording another instance proving that difference of structure is indicative of difference of habit."

Mr. Tompkins exhibited three species of Psychidæ hitherto unrecorded as British, *viz.*:—P. roboricolella, *Bruand*, bred June 26, 1858; P. salicolella, *Bruand*, bred June 23, 1858; P. tabulella, *Bruand*, taken July 24, 1854 flying about beeches at Mickleham; the names were determined from Bruand's Monograph of the family.

Mr. Stainton exhibited specimens of the coloured plates which were intended to illustrate Mr. Logan's projected work on the Lepidoptera of Scotland, on which the transformations of the following species were beautifully delineated, *viz.*:—Polyommatus Artaxerxes, Agrotis lucernea, Lampronia rubiella, L. quadripunctella and Lozotænia costana.

Mr. Westwood exhibited the larva of Anobium striatum commonly known as the "bookworm," and a living larva of Phlogophora meticulosa, found feeding on southern-wood, which he considered a very extraordinary food-plant for the insect.

Entomology of the Cape of Good Hope.

Mr. Adam White read the following extracts from a letter addressed to him by R. Trimen, Esq., dated Knysua, Cape of Good Hope, November 15, 1858:—

"My experience in this part of the world since last July tends to show that the entomologist in South Africa must not expect an abundance of active insect life; as yet I have not in any place seen as many insects congregated and visible at one time as in the woods of England in June or July. As far as the Lepidoptera are concerned, I have found it hitherto almost impossibte to discover the metropolis of any species; with the exception of some common Pieridæ and Hipparchiæ, which are to be found everywhere, the butterflies appear to be scarce. In this district the entomologist requires a great deal of patience, for the nature of the woods—with their rotting stumps, fallen logs, stones and immense variety of thorns—renders chasing insects an impossibility, and the only way is to stand quietly in some sunny nook, and catch them as they successively visit the spot. The following will show you the respective pro-

portions of the several genera of butterflies, as far as I have been able to obtain them, up to this time, and as well as I can make out the number of species:—

Papilio	3	Euplœa	1
Colias	1	Acræa	2
Pieris	3	Polyommatus	8
Anthocharis	1	Chrysophanus	1
Erebia	3	Zeutis	7
Mycalesis (?)	1	Thymele	2
Euryteia	1	Steropes	2
Cynthia	1	Pamphila	2
Philognomes	1	——— ?	2
Salamis	1		

"Of moths I have upwards of 120 species, of which Geometræ and Pyrales form the greater proportion; of Sphingidæ I have but five species, one Syntomis, two Anthrocera, one Smerinthus and one Trochilium. Sugar does not seem to succeed here in attracting them; I sugared twice without the least success, and the third time only found two moths, on sugared flowers. Light succeeds well on certain nights, and I have obtained a good many in that way.

"November 19. It has been very warm all the week and insects are visibly increasing in numbers every day. I have taken another Anthocharis (I think Danaë), Danais Chrysippus, a beautiful Zygæna, intermediate between Procris and Syntomis, &c.

"My collection of beetles comprises about ninety species of larger size and a good number of small species. The Lamellicorns constitute the most numerous section of the Coleoptera here, and many of the species are very curious and striking in their appearance. The whole district is overrun by numbers of juvenile green and black locusts, which hang in hundreds on the shrubs and plants, and strip them of their leaves and young shoots in a very short time. The day before yesterday I saw a Bittacus (of a species very common here) carrying a large fly along by one of its hind tarsi: the fly had evidently been abstracted from a spider's web, as it was wrapped in a webby shroud.

"It is worthy of remark how few species of Lepidopterous larva I can find; I imagine the greater number of them must feed at night, or high up on the trees.

"December 5.—I am going to morrow to some large woods near at hand to endeavour to obtain some wondrous butterflies I have been informed of; they have, according to my informant (an observant old farmer), 'hard wings' which 'snap' when they fly; they keep entirely within the forests, and are found sucking the sap from the Polygalæ that grow there: I thought of Cicadæ, and suggested them to my informant, but he knew the latter well, and insisted that those he meant were butterflies; and that there were several kinds, all large, and one with two tails on each hind wing. The only one I have in my descriptions as possessing two tails on each wing is Charaxes Xiphæus; it is probably that species.

"December 13.—I have been out to-day in the woods, from 8 A.M. to 3 P.M., but although I visited the express woods mentioned by my informant, I saw nothing of the 'snap-wing' butterflies he described; indeed, though a splendid hot day, I saw

very little in the insect way in the forest itself, though near it I captured a large and beautiful Trochilium, which must, I think, be quite new to Science, and some fine specimens of Danais Chrysippus."

Mr. White observed that no doubt the snapping sound alluded to was similar to that produced by the Ageronæ.

Mr. Waterhouse read a paper entitled "Notes on the British species of Heterocerus."

The President announced that the Council had resolved that all Members and Subscribers, whether residents in London or otherwise, shall in future be entitled to receive the Transactions of the Society gratuitously.

March 7, 1859.

Dr. Gray, President, in the Chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Transactions of the Linnean Society of London,' Vol. xxii. Pt. 3; presented by the Society. 'Konigliga Svenska Fregatten Eugenias Resa omkring Jorden under Befal' af C. A. Virgin, aren 1851—1853; by the Royal Academy of Sciences of Stockholm. 'An Accentuated List of British Lepidoptera,' 3 copies; by the Entomological Societies of Oxford and Cambridge. 'Journal of the Proceedings of the Linnean Society,' Supplement to Botany, No. 1; by the Society. 'Proceedings of the Royal Society,' Vol. ix. No. 33; by the Society. 'The Journal of the Royal Agricultural Society of England,' Vol. xix, Part 2; by the Society. 'Tijdschrift voor Entomologie uitgegeven door de Nederlandsche Entomologische Vereiniging,' Vol. ii., Parts 2 and 3; by the Netherlands Entomological Society. 'Insecta Caffrariæ,' Part ii.; by the Author, Professor C. H. Bohemann. 'The Zoologist' for March; by the Editor. 'The Athenæum' for February; by the Editor. 'The Literary Gazette' for February; by the Editor. 'The Journal of the Society of Arts' for February; by the Society. 'A Manual of British Butterflies and Moths,' No. 26; 'The Entomologist's Weekly Intelligencer,' Nos. 124—127; by H. T. Stainton, Esq. 'Linnæa Entomologica,' Vol. xiii; by the Entomological Society of Stettin. 'Description of New Species of Phytophagous Beetles;' by the Author, J. S. Baly, Esq. 'A Catalogue of British Coleoptera,' Part 2; by the Author, G. R. Waterhouse, Esq.

Election of a Member and a Subscriber.

The Rev. Evan Lewis, B.A., of Rothwell, Northamptonshire, was balloted for, and elected a Member, and W. B. Tegetmeier, Esq., of Muswell Hill, a Subscriber to the Society.

Exhibitions.

Mr. Stevens exhibited two specimens of Petasia nubeculosa, which had that morning emerged from the pupæ: he had reared the larvæ from eggs received from Perthshire, and the insects had passed two winters in the pupa state.

Mr. Stevens also exhibited some butterflies, chiefly Pieridæ, sent from Siam by M. Mouhot, and some beautiful Micro-Lepidoptera, taken by Mr. Diggles at Moreton Bay.

Mr. Douglas exhibited a box containing 1300 specimens of Coleoptera, taken during the last month, chiefly in the neighbourhood of Lee, but a few were from Hammersmith Marshes and Darenth Wood, amongst them were the following:—

Stenus solutus.
„ pubescens
Sunius intermedius
Calodera æthiops
„ nigrita
„ riparia
Phlœopora reptans
Sericoderus lateralis
Oxypoda n. sp.?
Stenolophus exiguus
Gyrophæna lucidula
Euryusa laticollis
Homalota flavipes
Thiasophila angulata
Quedius brevis
Saprinus piceus
Dendrophilus pygmæus
} Found in nests of Formica rufa.

Mr. Douglas also exhibited a monstrous species of Pulex found in grass at the margin of a pond, and some larvæ, supposed to be those of Trinodes hirtus, found under loose bark of oak, also a specimen of Rhyzophagus politus, *Hellw.*, *Fab.*, a species new to Britain, taken by sweeping in a ditch at Lee, in June.

Mr. Westwood exhibited a drawing of the larva of a species of the Dipterous Genus Thereva, remarkable for the anomalous development of the abdominal segments which were comparatively of so large a size, each being also transversely divided by an impression that there appeared to be double the usual number of joints, which added to the head, three thoracic segments (of the usual size) and the anal segment give the appearance of twenty-one segments, being eight more than the usual number; the eight abdominal segments being as it were duplicated, the alternate ones presenting a minute lobe on each side: the head is extremely small and dark-coloured, and the whole insect has the appearance of an elongated wire-worm. He had received it from Mr. Mitford, who had found it to be carnivorous, feeding on the pupæ of Alcucis pictaria. It has also been found to have destroyed several pupæ of the Sphinx Ligustri. No previous indication of its carnivorous habits had been recorded, nor had the peculiar structure of the abdominal segments been previously described.

Mr. Westwood also exhibited three species of insects recently received by him from Mr. Neitner at Ramboddo, in Ceylon, which have been found by that gentleman to be injurious to the coffee plantations. These consist of a species of Coccidæ (*Lecanium Coffeæ*) the scales of which infest the leaves in immense numbers; a minute moth, which Mr. Stainton thinks is referrible to the genus Gracilaria, and distinct from the Elachista coffeella of Guérin, which appears to belong to the genus Bucculatrix; the larvæ of this little moth mine the leaves of the coffee, as do also the larvæ of the third insect, a minute species of Muscidæ, which Mr. Haliday, to whom it had been referred, regards as belonging to the genus Agromyza.

Mr. Westwood also exhibited various insects which had been found to be injurious to books, in the Bodleian Library, where a careful hunt after book-worms is now

going on. In addition to small cockroaches and Lepismæ (generally dead and crushed) two, if not three species of Anobium (A. striatum and A. paniceum), and their larvæ were more commonly found; the latter gnawing the interior of the bindings as well as perforating the leaves. He considered that the larvæ might be destroyed by placing the infected volumes in a large close box in which a small quantity of benzine collas had been dropped.

He also exhibited an insect which he had received some time previously from Mr. Backhouse, of Gateshead, as a gigantic flea, and which he had exhibited to the Society on the 4th of May, 1857 (without, however, having previously had an opportunity of carefully examining it), and for which he then suggested the name of Pulex Imperator. He had, however, recently examined the insect more minutely, and had ascertained that it was a very young larva of a Blatta, much distorted by being crushed flat in rather an oblique position, and with most of the limbs broken off. A small portion of the base of one of the multiannular antennæ was visible in such a situation as to seem like a part of the mouth, but on microscopically examining it, as well as the portions of the legs still remaining, it became evident that the insect was not a flea, and on dissecting the mouth, its true character was at once detected.

Captain Cox exhibited some beautiful drawings of the larvæ of Lepidoptera, including those of Carpocapsa saltatans, *Westw.*, Phlogophora empyrea, Nyssia hispidaria, &c.

Mr. Stevens exhibited, on behalf of Signor De Tivoli, some larvæ of Lepidoptera, spiders and other insects, preserved by having been immersed in a chemical solution which had the effect of hardening them; in some instances the form and colour were well preserved.

Mr. Gorham exhibited a specimen of Tachyusa concolor, recently found by him at Chelsea Water-works.

Mr. Janson called attention to the recently published Catalogue of European Coleoptera, by Dr. Schaum, in which were many modifications and alterations, amongst which he might mention the Strepsiptera being included in it as a family of Coleoptera.

Mr. Adam White mentioned that he had just received an interesting letter from Mr. Gloyne, now a student in Geneva. Mr. Gloyne had been making excursions in the neighbourhood of that Swiss city, and was struck with the occurrence of species of Coleoptera not met with in Great Britain, but associated with species of common occurrence in our islands. He had not himself taken Omophron limbatum, but a friend of Mr. Gloyne's found that curious geodephagous beetle in banks, by pouring water on them here and there, when little groups of eight or ten individuals were sometimes met with.

Mr. White also remarked that he was glad to see in Dr. Schaum's new 'Catalogue of the European Coleoptera,' that the learned chief compiler of that Catalogue had separated the Brenthidæ from the Curculionidæ, and placed them close to the Longicorn Beetles.

Mr. White added that he had, some time back, tried to show at a Meeting of the Linnean Society, where he had exhibited the specimen of the rare Hypocephalus Desmarestii, belonging to J. Aspinall Turner, Esq., M.P., that Hypocephalus belonged to the Longicorns, and was close to Dorysthenes. He had then dwelt on the Brenthidæ not being far removed from the Longicorns; some, such as the great Eutrachelus Temminckii of Java, showing this affinity most markedly. He alluded

to Mr. Curtis's paper on that insect, with its fine drawing. Mr. White expressed himself pleased that in a Catalogue like Schaum's, philosophical arrangement, founded on an extensive study of the Coleoptera of all countries, had led Dr. Schaum to place Amorphocephalus, the solitary European representative of the Brenthidæ, just before the Longicorns.

The Secretary read a letter from L. Lardner, Esq., accompanying some living larvæ, apparently of a species of Curculio, from Calcutta, feeding on poppy seeds, received from Sir Jamsetjee Jejeebhoy.

Mr. Stevens read the following extract from a letter just received, addressed to him by Mr. A. R. Wallace, dated Batchian, Moluccas, October 29th, 1858:—

"As there is now a boat going which may just catch the mail at Ternate, I write a few lines to let you know of my having arrived here safe and commenced operations. I came here in a small hired boat with my own men, luckily it was fine weather, or 100 miles at sea with no means of cooking and only room for one day's water, would have been more than unpleasant. I stopped five days at the Kaiod Islands, just half way, and got a nice collection of beetles, a fair number of new species, and some curious varieties of those before found at Ternate and Gilolo. I have only been here five days, but from what I have already done, and the nature of the country, I am inclined to think it may prove one of the best localities I have yet visited; I have already twenty species of Longicorns new to me, nothing very grand, but many pretty and very interesting; the most remarkable is one of the Bornean genus, Triammatus, also several species of the elegant little genus Serixia, which have been very scarce or absent since I left Sarawak; I have also an elegant new Pachyrhynchus, a fine Ips, a small new Cicindela, and a small new species of Therates. In butterflies I have taken an imperfect specimen of a glorious new species very like Papilio Ulysses, but distinct, and even handsomer! I have also seen a female of a grand new Ornithoptera, but cannot say what the male will prove to be. I have several times seen what I think is a new species allied to Papilio Codrus, but they are too wild to catch: the Papilio allied to P. Sarpedon, which I found at Macassar, is also here, and two or three other species which I have not yet been able to capture."

Part I. of the fifth volume of the new series of the Society's 'Transactions' was announced as published.

April 4, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' Tome xiv. 2e Partie; presented by the Society. 'Mémoires couronnés et Mémoires des Savants etrangers,' publiés par l'Académie Royale des Sciences, des Lettres et des

Beaux-arts de Belgique, Tome xxvii.; by the Academy. 'On the Digestive and Nervous Systems of Coccus hesperidium,' by John Lubbock, Esq., F.R.S., F.L.S., F.G.S.; by the Author. 'The Zoologist' for April; by the Editor. 'Première Centurie de Longicornes du vieux Calabar,' par Auguste Chevrolat, &c.; by the Author. 'A Manual of British Butterflies and Moths,' Nos. 27 and 28; 'The Entomologist's Weekly Intelligencer,' Nos. 128—131; by H. T. Stainton, Esq. 'The Athenæum' for March; by the Editor. The Literary Gazette' for March; by the Editor. 'The Journal of the Society of Arts' for March; by the Society.

Election of Members.

W. S. Coleman, Esq., 7, Ampton Place, Gray's Inn Road; and W. Jeakes, Esq., 22, Camden Road Villas, Camden Town, were balloted for and elected members of the Society.

Exhibitions.

Mr. Stevens exhibited some beautiful Coleoptera, taken by Mr. Wallace, at Dory, New Guinea, amongst which were Eupholus Cuvieri, E. Schonherri, Promechus splendidus and Oxycephala speciosa. He also exhibited, from the same locality, a most extraordinary nondescript Dipterous insect, having long horn-like appendages to the eyes.

Mr. Smith mentioned that amongst the Hymenoptera recently sent by Mr. Wallace from Celebes, was a species of Dolichurus, which was interesting from the fact that the only other known species of this remarkable genus, D. corniculus, is European.

Mr. Janson exhibited five species of Coleoptera hitherto unrecorded as British, with notes of their localities, &c., as follows:—

1. *Oligota atomaria*, Eric., Kraatz. Colney Hatch, December 27, 1855. Distinguished from O. pusillima by its broader form and its pitchy black legs and antennæ.

2. *Stenus proditor*, Eric., Kraatz. Near Finchley, December 5, 1858.

3. *Platystethus nitens*, Sahlb., Kraatz. Highgate.

4. *Abracus granulum*, Eric., de Morseul. Walthamstow, Essex, May 18, 1851.

5. *Læmophleus duplicatus*, Waltl., Eric. Beneath bark of a dead oak near Highgate, March 27, 1859. Readily recognised from its congeners by the two impressed longitudinal lines on each side of the thorax, and the truncate elytra of the male.

Mr. Janson also exhibited the following Coleoptera:—

Carabus granulatus, Linn. Variety, having one elytron bright green, the other and the remainder of the upper surface of the usual brassy tint. Hammersmith, March 24, 1859.

Lyctus brunneus, Steph. (Xylotrogus). Felled elms, Highgate, August 11, 1858.

Stenolophus elegans. Ditch by the Fort below Gravesend, May 28, 1858. One specimen.

Lymnæum nigropiceum, Marsh. Southend, August 3, 1858. One specimen.

Mr. Janson announced that having recently placed his collection of Trichopterygidæ in the hands of the Rev. A. Matthews, that gentleman informed him that he has identified therein the following species, previously unknown as inhabitants of Britain:—

Ptinella Ratisbonensis, Gillm., *var.*
P. tenella, Eric. (*Microscopica* [Waltl. *in litt.*], Gillm.)
P. angustula, Gillm.

These insects were captured during the past year, at various points near London, beneath the bark of dead trees. Mr. Janson added that this announcement was made at Mr. Matthews' request, and that he (Mr. M.) is now preparing for publication, in the 'Zoologist,' a supplementary paper to his former valuable contribution on this family.

Mr. Wilson Saunders exhibited a living specimen of Scolopendra morsitans, found in a chest of tea from China, and some living examples of Branchipus stagnalis; this largest and most beautiful of British Entomostraca had lately been found by Mr. Brewer, jun., on Reigate Heath, in some shallow pools which were quite dry during the summer.

Dr. Gray observed that he had noticed this species on Blackheath, in puddles left by rain which had fallen within the previous twenty-four hours.

Mr. Saunders also exhibited some galls on branches of young oaks, also from Reigate, and remarked that they appeared to be those produced by Cynips Quercus-petioli, formerly observed only in Devonshire, but now apparently spreading over the South of England; although they do not contain so much tannin as foreign galls, yet as they could be obtained in large quantities, he thought it worthy of consideration whether they might not be advantageously collected and employed as a substitute for the foreign article, and the young plantations would certainly be much benefited by the removal of them.

Mr. Westwood remarked that these galls were now found in the Midland Counties as well as in the South of the kingdom.

Mr. Westwood exhibited specimens of the case-bearing larva of Coleophora gryphipennella, which had recently been very injurious to some pot-roses in a greenhouse.

Mr. Waterhouse exhibited British specimens of

Epuræa neglecta, Heer, Sturm, Erichs.
Anisotoma nigrita, Schmidt, Erichs.
Olibrus oblongus, Erichs.

Mr. Waterhouse stated that the first of these insects had long been named, by Mr. Murray, in Dr. Power's collection; that he (Mr. W.) had supposed the insect to be identical with an Epuræa in his own collection, which he made out to be the E. parvula of Sturm, and had not inserted the E. neglecta in the 'Catalogue.' Having, however, recently had an opportunity of comparing the two insects, he was convinced of their being distinct. E. neglecta was taken by Dr. Power, at Holt Forest, near Farnham. A. nigrita was taken by Dr. Power, at Addington, near Croydon: Mr. Waterhouse believed that the insect inserted in his 'Catalogue' as Anisotoma rubiginosa, with a note of doubt, was a small female of the same species. O. oblongus was found by Mr. Squire, at Horning Fen and Whittlesea Mere.

Mr. Waterhouse took this opportunity of mentioning that the following numbers had been omitted in the third edition of his recently published 'Catalogue of British Coleoptera,' *viz.*:—

No. 14 to Hister 12-striatus.
„ 2 to Oxylemus variolosus.

The omission of these numbers caused the names of these species to appear as synonyms of the preceding insects.

Mr. Stevens exhibited a fine Buprestis, allied to Catoxantha, found by Mr. Wallace at Gilolo, of which Mr. Adam White furnished the following description:—

"The Buprestidæ are separated into genera and even into great groups by characters which, in many other families of insects, would be deemed hardly important enough to be regarded as anything but specific. The subgenus, here briefly described, more nearly resembles Catoxantha in the shape of its thorax than Chrysochroa; it has an apparently dull-coloured look, compared with either of the two genera alluded to; its under side is decidedly metallic, except on the last segment of the abdomen beneath; its elytra are strongly grooved, and in their contour considerably resemble Catoxantha, differing in surface and in terminal pointing. It may be called Catoxantha (Demochroa) carinata.

"Catoxantha (? Demochroa) carinata, *n. s.*

"C. *Elytris viridi-purpurascentibus, creberrime acupunctatis, costis quatuor cultratis elongatis, costa brevi obliqua ad suturam prope basim, apice subtruncato, triapiculato; capite, cæruleo, purpureo et viridi decorato, antice inter antennas subcavato, et cultrato; thorace dorso irregulari, creberrime acupunctato, postice sulculis duobus curvates longitudinalita directis, et sulco ad latera singula; thorace, abdomineque subtus purpureis, pilis brevibus subdensis ochraceo-flaris, indutis, pedibus cyaneis, femoribus, basi præsertim, viridi et igneo variegatis, abdominis segmento ultimo subtus pallido flavo, dorso læte metallico-viridi.*

"Hab. in Insula Gilolo. Long. unc. 1, lin. 6."

May 2, 1859.

H. T. Stainton, Esq., V.P., in the chair.

The following donations were announced, and thanks ordered to be presented to the donors:—'Journal of Proceedings of the Linnean Society,' Vol. iii., No. 12; presented by the Society. 'Abhandlungen der Koeniglich Bayerischen Akademie de Wissenschaften,' Vol. iii., Part 2; by the Society. 'The Zoologist' for May; by the Editor. 'The Literary Gazette' for April; by the Editor. 'The Journal of the Society of Arts' for April; by the Society. 'The Entomologist's Weekly Intelligencer,' Nos. 132 to 135, and Vol. v.; 'Manual of British Butterflies and Moths,' Nos. 29 and 30.

Election of a Member.

Douglas Timmins, Esq., of Oriel College, Oxford, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. Stevens exhibited some butterflies taken by Mr. Wallace, in New Guinea; the most conspicuous being a beautiful Hestia, allied to H. D'Urvillei.

Mr. Westwood exhibited a number of specimens of Oxytelus sculptus, one of the smaller Brachelytra, which had been found by a correspondent upon young cucumber plants after dark, four different sowings of which had been destroyed without any trace of the depredator being visible, during the day. It was consequently supposed that wood-lice were the cause of the mischief, but on examining the plant with a light, after dark, vast numbers of this species, with a few individuals of two small species of Philonthus, were captured, which were considered by Mr. Westwood to be the cause of the damage in question, although contrary to the generally-received opinion of the insectivorous habits of the Staphylinidæ. Mr. Westwood referred to the occurrence of great numbers of these insects in decaying Fungi, Boleti and dung, considering that it was on the vegetable matter they fed, as was also the case with the larva of one of the species described in the Linnean 'Transactions,' by Mr. Walford, which destroys young wheat plants by gnawing through the stems.

Several members present dissented from this view, and Mr. F. Smith especially mentioned Oxyporus rufus, which, although always found in Fungi, is evidently, from its structure, a very voracious insect-feeder.

Mr. Westwood exhibited both sexes of Mutilla (Psammothera) flabellata, one of the Aculeate Hymenoptera, from South Africa, anomalous on account of the male possessing bipectinated antennæ, a peculiarity known only to occur in two or three other of the Aculeata. Mr. Westwood regretted that he was compelled to employ this term anomalous after observations made at the last meeting, and subsequently in the 'Intelligencer,' with reference to its alleged impropriety, considering that no other word so completely expressed the peculiarity of an animal which exhibited a departure from the ordinary structure of the group to which it belonged. It was erroneous to assert that it was only our ignorance which compelled us to regard such structures as irregularities or anomalies; on the contrary, it was our knowledge of vast numbers of species belonging to the group in question which enabled us to say what were its regular, normal or ordinary characters.

Mr. Westwood also exhibited three very interesting additions to the British lists. The first of these was the Blatta Acervorum of Panzer, which formed the type of the genus Myrmecophila, and which, although strictly belonging to the family of which the house cricket may be considered as the type, had been regarded by Mr. MacLeay as the osculant form between the Blattidæ, representing the cursorial, and the Achetidæ, representing the saltatorial, Hymenoptera. It had been found in moss by the Rev. F. W. Hope, in the Archdeacon's Copse, near Netley, Shropshire. The second was the Bethylus depressus of Fabricius (being the type of Klüg's genus Pristocera), and interesting amongst the Hymenoptera as forming one of the connecting links between the Aculeata and Terebrantia; it had also been taken by Mr. Hope, in Shropshire. The third of these insects was the Dryinus formicarius of Latreille, figured in the 'Genera Crustaceorum,' and of the greatest rarity on the Continent. This elegant insect was remarkable for the anomalous structure of its anterior tarsi, which are terminated by a long slender recurved forceps nearly as long as the entire tarsus: a single specimen had been taken by Dr. Baly, at Cobham, in October, and by him presented to Mr. Westwood.

Mr. Westwood also exhibited several specimens of the insects which injure books and book-bindings, namely, a small species of Anobium with punctate-striate elytra, in the imago state, which Mr. Westwood regarded as Anobium paniceum, but which Mr. Janson thought was not a native species (a question, indeed, of considerable

importance); these had been found dead in eastern manuscripts, with many living larvæ, which from their size might fairly be assumed to be those of this species of Anobium: also a Ptinideous larva, which Mr. Westwood had found gnawing the morocco covers of books in his own library, in the same manner as the Lepidopterous larva which he had exhibited at a previous meeting of the Society: also a large Ptinideous larva, found within the covers of a Syriac manuscript, which Mr. Westwood considered to be that of Ptinus fur, as dead specimens of that species had also been found in the same collection of books.

Mr. Smith observed that he had seen the female of Vespa vulgaris on the wing on the 14th of February last,—a proof of the unusual mildness of the season at that period.

The Secretary read the following communication from Mr. A. R. Wallace, Corresponding Member of the Society, dated Batchian, Moluccas, Nov., 1858, intituled

Remarks on enlarged coloured Figures of Insects.

"The practice of publishing highly-coloured figures of insects, more especially of Coleoptera, above the natural size, is so very general that I fear I shall stand almost alone in protesting against it.

"Coloured figures should represent nature in every respect. They should as much as possible take the place of actual specimens, enabling us more readily to determine species than can be done by descriptions, and making us acquainted with the actual appearance of the rare and beautiful forms which are daily being discovered. Insects, it is true, vary very much in size; yet, as a general rule, magnitude is a great assistance, and often an important supplementary character, in determining species. This assistance we altogether lose by enlarging our coloured figures; for not only does it require time to look for the line of size appended to each, and to consider the effect of reducing the insect to that size, but a small and obscure species is often so transformed, by all its delicate detail being brought out and exaggerated, that we may pass it over altogether as something we have never seen, although the identical insect may be waiting for its name in our cabinet. The evil is made still greater by no system being followed. In the same plate we have insects figured of the natural size, and others slightly or very much enlarged; so that in some cases the largest figure represents the smallest of the insects. See White's Cat. of Longicorns in B. M. tab. 6, figs. 5 and 9. An instance of the same anomaly occurs also, I believe, in one of the plates of Longicorns illustrating Mr. Pascoe's second paper in the Transactions of the Society.

"There is also another evil in this unsystematic enlargement of insects,—that we cannot readily check the accuracy of the figures, which must be often very doubtful, as the artist must trust solely to his eyes for the various proportions; whereas in figures of the natural size a fine pair of compasses will both give the principal dimensions accurately, and enable any one in a moment to test their accuracy. Now, though *size* may not be, yet *proportion* is certainly an excellent specific character; and it cannot be considered a trifling matter that, by enlarging our figures in no determinate scale, we can no longer use this character with confidence.

"In turning over good coloured plates of an entomological Monograph or of a local Fauna, we may get at once a mass of useful information. We can compare the

species with those of our own country, or of any other district with which we may be acquainted, or the species of a new genus with those of an allied group in our cabinet, seeing at a glance their several relations of size, form and colour. But this can only be done if the figures are of the natural size. In the other case we get quite an erroneous idea of the new group or of the unknown Fauna,—erroneous not only as to size, but in form and colour also; for a mass of colour, though of the same tint, strikes the eye more forcibly than a small portion; and in like manner any abnormal form becomes far more striking when exhibited of a larger size than usual. Let any one compare two plates of well-known insects, in one of which all the figures are of the exact natural size (representing actual specimens), in the other variously enlarged (representing nothing in nature), and he will be convinced that the former is in a very great degree more useful and instructive than the latter. It is the difference between truth and error.

"Species which are too small to be well coloured of the natural size should be represented by outlines enlarged in some definite given proportion; and such figures should be given on separate plates, so as to be comparable with each other.

"To make our coloured figures larger than nature has formed the objects which they are intended to represent, in order to make them more showy and ornamental than they really are, is quite unworthy of Science. Such figures do not possess any one solid recommendation, while they do possess many positive disadvantages to the scientific inquirer. They are also likely to disgust the incipient entomologist with his study when he finds that his cabinet can never be so showy as the plates on which entomologists profess to represent his specimens.

"In Lepidopterous figures nature is seldom so falsified. Who ever thinks of figuring a new Erycina or Lycæna so as to equal in size a Papilio or a Morpho? The thing would be scouted as absurd, yet it would be in reality not one whit more objectionable than is the present practice as regards Coleoptera.

"I beg, therefore, to propose that the Entomological Society of London should lead the way in this salutary reform, and allow, in its 'Transactions,' fully-coloured figures only of the natural size, and outlines enlarged in some definite degree which should be uniform for at least all the figures on the same plate."

Several members present objected to the opinions expressed by Mr. Wallace, and Mr. Smith suggested that Mr. W.'s dislike to enlarged coloured figures might arise from the fact that he had never seen any well-executed plates containing such figures.

Mr. W. Wilson Saunders read a paper on some remarkable Dipterous insects from Dory, New Guinea, having long horns arising under the eyes, and projecting forward like those of some of the deer tribe. The specimens were exhibited at the last meeting of the Society, and were sent to this country by Mr. Wallace. Mr. Saunders proposed for their reception the genus Elaphomya, and described five species, *viz.*, E. cervicornis, E. Wallacei, E. alcicornis, E. brevicornis, and E. polita.

June 6, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Journal of the Royal Dublin Society,' Nos. 12 and 13; presented by the Society. 'Journal of Proceedings of the Linnean Society,' Supplement to Botany, No. 2; by the Society. 'Catalogue of the described Diptera of North America,' prepared for the Smithsonian Institution, by R. Osten-Sacken; by the Smithsonian Institution. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., &c., Part XVII., Pyralides; by the Author. 'The Zoologist' for June; by the Editor. 'Bibliotheca Historico-Naturalis heraus gegeban' von Ernst A. Zuchold, Achter Jahrgang, Heft 2; by the Author. 'Boston Journal of Natural History,' Vol. vi. No. 4. 'Proceedings of the Boston Society of Natural History,' Vol. vi. Nos. 11—22; by the Society. 'Eleventh Annual Report of the Board of Agriculture of the State of Ohio,' to the Governor, for the year 1856; by the Board. 'Report of the Commissioner of Patents for the year 1856;' by the Patent Office of the United States. 'The Journal of the Society of Arts' for May; by the Society. 'The Literary Gazette' for May; by the Editor. 'The Athenæum' for April and May; by the Editor. 'The Entomologist's Weekly Intelligencer,' Nos. 137—140; 'A Manual of British Butterflies and Moths,' Nos. 31 and 32; by H. T. Stainton, Esq. 'Stettiner Entomologische Zeitung,' Nos. 1—6; by the Entomological Society of Stettin. 'Fabricia Entomologica,' Part I., No. 3; by the Author, M. H. Jekel. 'Description de la Leptura Militaris,' par M. Aug. Chevrolat; 'Description de Nouvelles espèces de Coléoptères, par M. Aug. Chevrolat; by the Author.

Exhibitions.

Mr. Stevens exhibited some fine examples of both sexes of Papilio Œnomaus, sent from Ternate by Mr. Wallace.

Mr. Stevens also exhibited specimens of Lœmophlæus Clematidis, of which species above a hundred examples had been captured by Dr. Power, Mr. Jeakes and himself, near Gravesend; Stenolophus elegans, of which Dr. Power and himself had secured about fifty, at Southend; and a living example of Hetærius sesquicornis, one of several which he had recently taken near Hampstead, in nests of Formica fusca.

Mr. Janson exhibited specimens of Haploglossa gentilis, found by Mr. F. Smith, in company of Formica fuliginosa, at Hampstead. The species had not hitherto been detected in this country.

Mr. R. B. Were exhibited a specimen of Crioceris merdigera having a transverse lateral black patch on each elytron, which had been recently found in a garden at Homerton.

Mr. Stainton stated that when at Ratisbon lately, Dr. Herrich-Schäffer had informed him of a new Lepidopterous insect frequenting ants' nests, which he had received from the East Indies; and he had been exceedingly surprised to hear that

this new inmate of the formicarium was *a butterfly*, apparently of the family Lycænidæ. Dr. Herrich-Schäffer had been assured that this insect made no use of its wings, and merely walked about in the ants' nests, having thick legs, of a peculiar construction, not unlike wooden legs.

Mr. Westwood had little doubt but the butterflies alluded to were the singular insects figured by Dr. Horsfield in his 'Lepidopterous Insects of Java,' Plate II., under the generic name of Symetha (Polyommatus Symethus of the 'Encyclopédie Méthodique' being the type), and having remarkably developed and thick tarsi. This opinion was subsequently confirmed by Mr. Stainton.

Mr. Douglas exhibited the following insects, and notes of their economy:—

"*Ornix Scoticella*, with its pupa-case projecting from its puparium, within a leaf of Sorbus aria.

"*Coccyx splendidulana*, Guén., with its pupa-case projecting from its puparium, in a piece of the bark of a willow, where I found it in March. Mr. Wilkinson, in his 'British Tortrices,' says the imago of this species 'appears among fir trees;' but this does not accord with my experience, and in the present instance there is not a fir tree within half a mile of the place where I found the pupa.

"*Raphidia* ——— ? Last February, when examining, in Richmond Park, the rotten pieces of oak branches blown down by the wind, I found, in the centre of two of them, a larva of a Raphidia. What they did there I do not know; they appeared to have nothing except the wood to eat, but they were very lively. I took them home and put them in a large glass jar, still in the wood; and there they remained till the 6th of May, when I found two perfect insects. Attached firmly by the outstretched feet, was the pupa-skin which I now exhibit; it was in a vertical position, rent on the back where the imago had emerged, and resembled the exuvium of a dragon-fly, such as we constantly see attached to the stems of plants growing in water. The other pupa-skin I could not find. Twenty-five years ago Mr. Waterhouse read a memoir on the transformations of a species of Raphidia, to this Society, and it is published in the first volume of the 'Transactions.' I should not have deemed it worth while to bring the subject again under your notice, only that my observation of the position of the larva goes to prove his supposition that the habit is not carnivorous; and, moreover, I thought it might be of interest to show that, in the instances I noticed, the larvæ were not immediately beneath the bark of solid wood as his were, but in the centre of rotten branches, so rotten indeed that they crumbled beneath the fingers. Possibly they are not the same species as Mr. Waterhouse's. Percheron says the larvæ feed on larvæ of Arachnides and Onisci; certainly mine had no such food after I got them, and as the pupa state lasts, according to Percheron, about fifteen days, mine either fasted two months or fed on the wood.

"*Trinodes hirtus*. The larva I exhibited recently, at a meeting of this Society, has, as I expected, produced an example of Trinodes hirtus. The following is a description of the larva:—

"Length 1½ line. Dirty white; head large, testaceous; second segment narrow, black; each segment is narrowly margined with black, and down the back is a row of black spots. The whole larva is densely clothed with black, stout hairs, arising in fascicles; these hairs are erect on the back, but those along the sides are rather curved; they are shortest at the head and anus, but the longest are more than half as long as the body. The larva is without the dense anal tufts of hairs which are so conspicuous in the larva of *Tinodes sericea*.

"The pupa state was assumed about the middle of May, within the skin of the larva, and under the web of the spider in whose company both this species and Tiresias serra live together under the loose bark of old oak trees. The imago appeared on the 3rd of June."

Mr. Stevens communicated the following extracts from a letter received by him from Mr. A. R. Wallace, dated Batchian, January 28, 1859:—

"I had determined to leave here about this time, but two circumstances decided me to prolong my stay—*first*, I succeeded at last in taking the magnificent new Ornithoptera, and, *secondly*, I obtained positive information of the existence here of a second species of Paradisea, apparently more beautiful and curious than the one I have obtained. You may perhaps imagine my excitement when, after seeing it only two or three times in three months, I at length took a male Ornithoptera. When I took it out of my net, and opened its gorgeous wings, I was nearer fainting with delight and excitement than I have ever been in my life; my heart beat violently, and the blood rushed to my head, leaving a headache for the rest of the day. The insect surpassed my expectations, being, though allied to Priamus, perfectly new, distinct, and of a most gorgeous and unique colour; it is a fiery golden orange, changing, when viewed obliquely, to opaline-yellow and green. It is, I think, the finest of the Ornithoptera, and consequently the *finest butterfly in the world?* Besides the colour, it differs much in markings from all of the Priamus group. Soon after I first took it I set one of my men to search for it daily, giving him a premium on every specimen, good or bad, he takes; he consequently works hard from early morn to dewy eve, and occasionally brings home one; unfortunately several of them are in bad condition. I also occasionally take the lovely Papilio Telemachus, *n. s.*

"I have sent off a small box containing four males, one female, and one young bird of the new Batchian Paradisea, besides one red-ticketed private specimen; six males and five females of the new Ornithoptera, and seven Papilio Telemachus.

"Tell Mr. Gray and Mr. Gould that the Paradisea had better not be described yet, as I am making great exertions to get the second species, evidently of the same genus, which will enable a generic character to be more accurately given. The butterflies, I trust, will be both figured, male and female, either in Mr. Hewitson's book or in Ent. Soc. Trans. For the Ornithoptera I propose Crœsus as a good name. Butterflies are scarce; good beetles turn up occasionally, but nothing very grand. I have now a handsome series of Buprestidæ, and a remarkably pretty lot of Longicorns; one of my last acquisitions is a grand bronzy Tmesisternus, 1½ inch long, a single specimen only. In almost all orders, and in birds, there is a deficiency of species; yet there are so many pretty and brilliant things, and a few so grand and new, that on the whole I am inclined to think my Batchian collection will be the best I have made anywhere.

"Another reason which may induce me to stay perhaps two or three months longer at Batchian is that I have had no fever here, which I have never been free from two months at a time for the last two years before; and I may therefore hope to get my health well established for my next journey to New Guinea.

"The butterflies will make a show-box which will, I think, be admired almost as much as the birds of Paradise."

Mr. Westwood observed that he had little doubt the male Ornithoptera of which Mr. Wallace had given such a glowing description, in the letter just read, was the Ornithoptera Tithonus of De Haan, figured on the first plate of his fine work on the

'Insects of the Dutch Settlements,' the hitherto unique specimen of which is in the Leyden Museum, and was seen by Mr. Westwood on his visit last year; he had also little doubt that the female would prove to be the O. Victoria of G. R. Gray, figured, some time since, in the 'Proceedings of the Linnean Society,' from a specimen taken by Mr. M'Gillivray in one of the islands of the Eastern Archipelago, and now in the British Museum collection.

Mr. Shepherd thought, with Mr. Westwood, that Mr. Wallace's description agreed with O. Tithonus, but considered it hardly possible that Mr. Wallace was not acquainted with De Haan's figure. Previous to leaving this country for the East, Mr. Wallace had carefully investigated the works containing descriptions and figures of the entomological productions of the countries he was about to visit; and it seemed almost incredible that he could have overlooked or forgotten this fine insect.

Mr. Baly read a paper on new species of Phytophagous insects, together with the characters of a new genus, Paralina: this latter is closely allied to Lina and Chrysomela, and is separated from these genera on account of its produced meta-sternum, which, passing forwards between the meso-coxæ, articulates with the base of the prosternum, entirely concealing the meso-sternum; its type is Lina Indica, *Hope*.

July 4, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be given to the donors:—'Proceedings of the Royal Society,' Vol. ix. No. 34; presented by the Society. 'Farm Insects; being the Natural History and Economy of the Insects injurious to the Field-crops of Great Britain and Ireland, and also those which infest Barns and Granaries; with suggestions for their destruction.' By John Curtis, F.L.S., &c. Part I.; by the Author. 'The Zoologist' for July; by the Editor. 'A Manual of British Butterflies and Moths,' No. 33; 'The Entomologist's Weekly Intelligencer,' Nos. 141 to 144; by H. T. Stainton, Esq. 'The Athenæum' for June; by the Editor. 'The Journal of the Society of Arts' for June; by the Society. 'The Literary Gazette' for June; by the Editor. 'Exotic Butterflies,' Parts 30 and 31; by W. W. Saunders, Esq.

The following works were announced as having been recently purchased for the Society's Library:—Olivier, 'Entomologie,' 8 Vols. Boisduval and Guenée, 'Species Général des Lepidoptères,' 7 Vols. and 7 Fasciculi of Plates. Fabricius, 'Systema Antliatorum.' MacLeay, 'Annulosa Javanica,' Part I. Martyn's 'Spiders.' Walckenaer, 'Faune Parisienne, Insectes,' 2 Vols. 'Zoological Journal,' 5 Vols. Spinola, 'Essai Monographique sur les Clérites,' 2 Vols. Guérin-Méneville, 'Iconographie du Règne Animal, Insectes.' Redtenbacher, 'Fauna Austriaca der Käfer.'

Election of a Member.

W. D. Crotch, Esq., Uphill House, Weston-super-Mare, was balloted for and elected a Member of the Society.

Exhibitions.

Mr. Jeakes exhibited a specimen of Arrhenodes maxillosus, *Oliv.*, a North-American Curculio of the family Brentidæ, but which had been found flying in a garden at Camden Town by Miss Jeakes.

Mr. Bond exhibited some Lepidoptera taken at Freshwater, Isle of Wight, amongst which were beautiful varieties of Setina irrorella, a series of an apparently new species of Coleophora, Cochylis flaviciliana, &c.; he also exhibited a splendid living specimen of Calosoma sycophanta, found on the coast at Freshwater a few days previously, and had since been fed on the larva of Biston hirtarius, of which it devoured three or four full-grown examples daily.

Mr. Shepherd exhibited specimens of Deleaster dichroa, lately taken near London.

Mr. A. F. Sheppard sent for exhibition two specimens of Erastria venustula, taken near Loughton, Essex.

Mr. Janson exhibited the following species of Coleoptera, hitherto unrecorded as British, *viz.*, Stenus opticus, *Grav.*, from Mr. Jeakes' collection, taken by Mr. Squire in Horning Fen; Conosoma pedicularium, *Grav.*, from Holme Fen; and Scolytus Pruni, *Ratz.*, taken near London.

Mr. Mitford exhibited a fine series of Psyche fusca, which he had lately bred from the larvæ taken near Hampstead; and a specimen of Carabus intricatus, found near Bath, being a new locality for this fine species.

Mr. Holdsworth exhibited the nest and eggs of Hydrous piceus, from the aquarium of the Zoological Society, in the Regent's Park.

Mr. Gorham exhibited specimens of Anchomenus livens, taken on sugar placed on trees to attract Noctuæ.

Mr. Stevens exhibited an apparently new species of Phycita, taken near Mickleham; and some beautiful Lepidoptera, chiefly Tineina, sent from Moreton Bay, by Mr. Diggles; also the drawing of the larva of a species of Gastrophasia, *Guén.*, and the moth reared therefrom.

Mr. Stevens also exhibited both sexes of the splendid Ornithoptera alluded to by Mr. Wallace in the letter read at the last meeting of the Society; and also both sexes of the beautiful Papilio allied to P. Ulysses, for which Mr. Wallace proposed the specific name of "Telemachus," which had arrived in this country since the last meeting. He observed that the Ornithoptera, although allied to O. Tithonus, *DeHaan*, was by no means identical with that insect, as had been conjectured by Mr. Westwood, from the description given in Mr. Wallace's letter.

Mr. Westwood exhibited, and read the description of, a new and beautiful species of Phasmidæ, for which he proposed the name of Donelytron Batesianum, and to publish a coloured figure in the 'Transactions' of the Society, it having been forwarded by Mr. Bates, from the Amazon River, too late for representation in Mr. Westwood's monograph on the family, published by the Trustees of the British Museum.

Mr. Westwood also exhibited a fine Papilio, collected in New Caledonia, by Mr. MacGillivray, of which the following are the characters:—

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Papilio (Ulysses, *var.*) Ulyssinus, *Westw.*

Alis nigris dimidio basali cæruleis, corpore et basi alarum viridi irroratis, venulis tribus venæ medianæ macula holosericea nigra singulatim indutis, incisuris marginalibus albido maculatis; alis subtus fuscis, luteo-variis striga transversa areæ discordalis, lutea; posticis lunulis 6-maculaque anali luteis, squamis cæruleis supra marginatis. Expans. alar. unc. $3\frac{3}{4}$.

Mr. Westwood, in describing this insect, called attention to the state of the question as to the views of the modification of species entertained by different recent writers, and observed that it appeared to him to afford an additional proof of the fact that, whilst many species of insects seemed to be free, under any changes of time or place, from more than occasional and slight *individual* variation, other insects evidently exhibited decided modifications of higher than individual character, wherever they existed in distinct localities. Of the former of these kinds of species he quoted Cynthia Cardui, which maintained its pure specific character almost all over the world (to which Mr. Douglas added Deiopeia pulchella); whilst of the other kind Papilio Paris, and apparently P. Priamus (to which P. Ulysses might now be added), might be cited. Hence Mr. Westwood considered that the fine Papilio exhibited that evening was another local variety of P. Ulysses; and he suggested for it the sub-specific name of "Ulyssodes." He added that in the British Museum collection is another geogra phical sub-species, also from New Caledonia, in which the male has scarcely any trace of the silky patches on the fore-wings, although agreeing in size with Ulyssinus. For this he proposed the name of P. (Ulysses) Ulyssellus. This diversity in the modificational powers of certain species had, he believed, not been sufficiently noticed in treating upon the question of the modification of species. He considered it would be advisable, however, to give to each decided geographical modification of a species a separate specific or sub-specific name.

Mr. Waterhouse admitted the existence of decided and well-marked geographical races amongst certain insects, citing certain species of Philippine Pachyrhynchus. He had not, however, deemed it necessary to give to these races distinct names. He also noticed the fact that whilst certain species seemed never to vary (Coccinella 7-punctata for example), other species in the same genus were so variable, in the same locality, that it was scarcely possible to obtain two specimens alike.

Mr. Westwood also observed that he was not sure whether the grand new Ornithoptera, for which Mr. Wallace proposed the name of "Cræsus," might not be a local variety of O. Priamus.

Mr. Pascoe stated, with reference to his papers on the Longicorn Coleoptera, published in the 'Transactions' of the Society, that he had ascertained his genus Blemmya was identical with Euryarthrium, *Blanch.*, and that Anomæsia was referrible to Eunidia, *Erich.*, which is also the Evethis of Dejean. His names therefore, being the most recent, must be suppressed. He also mentioned that Sophronica, *Dej.*,

was synonymous with Dasyo, and that his Pachypeza implex appeared to be the Cacostola leucophæa of the same author.

Mr. Smith read some notes on the economy of the Ichneumons constituting the genus Pezomachus of Gravenhorst, with observations on Pezomachus fasciatus.

Mr. Waterhouse read two papers, intituled "Notes on the British Species of Donacia," and "Notes on the British Species of Cissidæ."

Part 2 of the current volume of the Society's 'Transactions' was on the table.

August 1, 1859.

J. O. Westwood, Esq., F.L.S., in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors: — 'Proceedings of the Royal Society,' Vol. x., No. 35; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. iv., No. 13; by the Society. 'Proceedings of the Zoological Society of London,' Nos. 370—391; by the Society. 'Catalogus Hemipterorum, Herausgegeben von dem Entomologischen Verein zu Stettin;' by the Society. 'Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien, Jahrgang 1858;' by the Society. 'Errinerung an Mitglieder der Mathematisch-Physikalischen Classe der Königlich Bayerischen Akademie der Wissenschaften, von Dr. Carl Friedrich Philipp von Martius, Secretari der gennanten Classe;' 'Monumenta Secularia, II. Classe;' 'Almanack für das Jahr 1859;' by the Königlich Bayerischen Akademie der Wissenschaften. 'Farm Insects,' No. 2; by the Author, J. Curtis, F.L.S., &c. 'The Zoologist' for July; by the Editor. 'The Literary Gazette' for July; by the Editor. 'The Journal of the Society of Arts' for July; by the Society.

The following works were announced to have been recently purchased for the Society's Library: — Mulsant, 'Coleoptères de France,' 8 Vols. Silberman, 'Revue Entomologique,' 5 Vols. Erichson, 'Naturgeschichte der Insecten Deutschlands,' Vol. i. Fas. 1—3; ii., 1—6; iii. and iv., 1 and 2. Ratzeburg, 'Die Forst Insecten,' 6 Vols. Germar, 'Zeitschrift für Entomologie,' 5 Vols. Koch, 'Arachniden,' 16 Vols.; and 'Uebersicht des Arachniden Systems,' 5 Parts.

Mr. H. W. Bates, Corresponding Member of the Society, who had lately arrived in England, was present, and very cordially received by the Meeting. He has devoted the last thirteen years to the investigation of the Entomology of the Valley of the Amazons; and the collections which he has from time to time forwarded to this country sufficiently attest his energy and perseverance under the dangers and hardships to which he has been exposed.

Exhibitions.

Mr. M'Lachlan exhibited specimens of Cochylis Francillana, with the pupa-cases from which they were bred, projecting from a stem of the wild carrot, in which the larva feeds; they were found in February last, at Forest Hill. Also specimens of Rhodophæa rubrotibiella, taken recently at Forest Hill, in the same locality as the two

specimens exhibited by him at the meeting of the Society in September last, and then new to Britain.

Mr. M'Lachlan also exhibited an example of Ochsenheimeira vacculella found at Lewisham, on the 28th ult., in a most singular situation for the imago of a Lepidopterous insect, namely, under close bark on the stump of an old alder tree, about three feet from the ground.

Mr. Bond exhibited the larva of Drilus flavescens, found near Folkestone.

Mr. Lewis exhibited a living example of Chlænius Schrankii, of which he had lately taken about sixty specimens near Luccombe, Isle of Wight.

Dr. Wallace exhibited a specimen of Deilephila lineata, taken by Dr. Burkill, in 1856, at Tremeri, in Ireland; and Agrotis valligera, from the same locality. He also exhibited examples of the following species, which he had lately found on a recent visit to Waterford, namely, Leucania littoralis, Mamestra abjecta, Cidaria populata, Larentia salicaria, Eupithecia denotaria, E. constrictaria, E. satyraria, Acidalia immutaria, and A. inornaria. Euchelia Jacobææ and Cetonia aurata were in great plenty in the neighbourhood; the latter species, he was informed, had been very rare till late years.

Mr. Mitford exhibited fine specimens of Trochilium Chrysidiformis, Timandra prataria, and Spilodes palealis, taken near Folkestone.

Mr. Westwood exhibited a mass of the empty cocoons of Ilythia sociella, forwarded to him by Professor Harvey, of Dublin, of which the Irish naturalists had failed in determining the nature, which had been taken from the stomach of a cow. The only explanation which he could give of so unusual a situation was, that, as the social caterpillars of these species frequent the nests of humble bees in considerable numbers, it was probable that the cow, whilst grazing, had come upon the nest of a moss-carder Bombus, and had chewed it together with the grass, the stomach not having had the power to dissolve the mass of cocoons. Mr. Bond confirmed this opinion, having found the mass of cocoons of the Ilythia in the nest of the moss-carder bee.

Mr. Westwood had observed, last season, some elm trees near Oxford, which were infested by the Scolytus destructor in the heat of the summer, exuded sap, and attracted large quantities of insects. One of these, this season, has died off, still emitting small patches of extravasated sap: this had attracted vast quantities of Cetonia aurata, the tree from the base of the trunk to the topmost branch being covered by hundreds of specimens, in clusters of a dozen or score together, producing shining masses visible at some distance, and which had attracted Mr. Westwood's attention to the insects. Many had become so stupified from the fluid they had imbibed that they had fallen down helplessly to the ground. Their sense of smell must have been extremely acute, and the odour of the sap (in very small quantities in each place) very penetrative and diffusive, in order to have attracted so great an assemblage of beetles.

Mr. Douglas remarked that an almost imperceptible exudation from the trunks of trees was often caused by the young larva of Cossus ligniperda.

Mr. Tegetmeier described a practical application of Shirach's discovery respecting the power of bees to raise a new queen from a neuter or worker grub; by means of which the contents of old hives can be taken without destroying the bees or sacrificing any brood. The plan consists in driving out the queen,

and about half the bees, in the spring, and establishing them as a new swarm, when the bees remaining in the old hive have to rear a new queen from a worker grub. From the time required to accomplish this, it follows that no eggs can be laid for about three weeks; by this time the workers producing eggs laid by the old queen will have been hatched out, and the cells filled with honey, when the whole of the bees are to be driven out, and the honey, which will be found perfectly free from brood, retained for use. The plan had been very successfully worked at the bee-house of the Apiarian Society, and specimens of the results were submitted to the Meeting.

September 5, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors: — 'Proceedings of the Royal Society,' Vol. x. No. 36; presented by the Society. 'Farm Insects,' Parts 3 and 4; by the Author, John Curtis, Esq., F.L.S. 'The Zoologist' for September; by the Editor. 'Smithsonian Contributions to Knowledge,' Vol. x. 'Annual Report of the Board of Regents of the Smithsonian Institution for the year 1857; 'Reply to the Statement of the Trustees of the Dudley Observatory,' by Benj. Apthorp Gould, jun.; 'Defence of Dr. Gould, by the Scientific Council of the Dudley Observatory;' by the Smithsonian Institution. 'The Athenæum' for July; by the Editor. 'The Journal of the Society of Arts' for August; by the Society. 'The Literary Gazette for August; by the Editor.

Election of a Subscriber.

R. W. Fereday, Esq., of 2, Leighton Villas, Talbot Road, Kentish Town, was balloted for and elected a Subscriber to the Society.

Exhibitions.

The President exhibited, on behalf of their captor, Dr. Power, the following British Coleoptera, with localities and dates of capture:—

Anchomenus versutus, *Gyll.* Wimbledon, July 30, 1858.
Polystichus fasciolatus. Sheerness, June and August, 1859.
Trechus longicornis. Banks of Ribble, July, 1859.
Aerognathus mandibularis, *Gyll.* Darenth, June 19, 1859.
Odacantha melanura. Merton, August. 1859.
Deleaster dichrous. Colney Hatch. June 25, 1859.
Anchomenus pelidnus (var. *Thoreyi?*). Merton, July, 1859.
Ancylophorus glabricollis, *Eric.* Merton, July 26, 1859.
Helophorus intermedius. Merton, July, 1859.

The two last-mentioned species had not previously been recorded as natives of Britain.

Mr. Smith remarked, with reference to Polystichus fasciolatus, that Mr. Hewitson took this species in some plenty, on the shore to the west of Southwold, near Lowestoft; they were found under stones above the shingle on the sloping shore, in front of the salt marsh beyond which is the mud wall leading to the ferry over to Walberwick. The salt marsh abounds in species of Coleoptera. The date of capture was the month of April.

Mr. Stevens exhibited a portion of a collection of Coleoptera and Lepidoptera made by Mr. Trimen in South Africa, about 300 miles east of the Cape of Good Hope; and a fine series sent from Sierra Leone by Mr. Foxcroft.

Mr. Stevens also exhibited a living specimen of Locusta migratoria, which he had captured near Brighton, in which neighbourhood, he stated, the species was unusually common this autumn.

Dr. Knaggs observed that he had seen a specimen lately taken at Camden Town.

Mr. M'Lachlan exhibited a specimen of Hadena peregrina, which he had lately captured at Freshwater, Isle of Wight, being the second recorded British example; also Phibalapteryx gemmaria and Eupœcilia flaviciliana, from the same locality.

Dr. Allchin exhibited a specimen of Synia musculosa, taken at Brighton, and two fine examples of Nola centonalis, taken in Kent.

Mr. Janson exhibited a fine new species of Adelops, found by M. Jacquelin Duval in the Pyrenees, and for which he proposed the specific name of Bonvouloirii.

Dr. Knaggs exhibited the following Lepidoptera, with notes of capture:—

Clostera Anachoreta. He had lately been fortunate enough to capture eleven larvæ of this insect in one of the home counties, and succeeded in rearing ten moths; a friend who subsequently took a pupa presented it to him, and this also reached the imago state. The only reputed British examples of this species hitherto known are contained in the British Museum Collection, and were obtained by the late Dr. Leach from the collection of Mr. Spratt: so many years having elapsed without the occurrence of other specimens, its claim to rank as a British insect has been almost universally disputed, and the present capture may therefore be looked upon as a re-discovery.

Aplecta occulta. A specimen taken in his own field at Camden Town in August last. Few examples of this fine insect have occurred in the southern districts of Britain. He had captured, during the past three years, upwards of ninety species of Noctuæ in this piece of ground.

Emmelesia tæniata. Taken by B. Piffard, Esq., at Tintern, at the end of June; the locality is interesting, the insect having previously only occurred in Ireland and in the Lake District.

Eupithecia tenuiata. Also taken by B. Piffard, Esq., at the same time and place.

Nonagria concolor. Taken at Folkestone, end of June. Some of the Members present were of opinion that it was not that species, the examples being paler and apparently a more slender insect than those found in the fen district.

Simaethis vibrana. Taken at Folkestone, end of June. Previous captures of this insect certainly do not exceed six examples.

Diplodoma marginipunctella. Bred by Dr. Knaggs from larvæ, taken chiefly near Epping, at the beginning of June. Dr. Knaggs observed that the case-bearing larvæ of this species were by some entomologists considered to be entirely carnivorous; he had, however, found them to feed freely on bramble and hazel.

Melanippe fluctuata. A singular variety, destitute of the larger costal blotch, the central spot being thereby brought out conspicuously.

Dr. Knaggs also exhibited the living larvæ of Acidalia strigillata, he believed never before seen in this country; they were reared by him from the egg, and were a few weeks old: he observed that he had supplied them with various plants as food, but all were rejected by them till (by the advice of Mr. Henry Doubleday) he had given them the common knot-grass (*Polygonum aviculare*), on which they fed freely.

And lastly, Dr. Knaggs exhibited a male of Pamphila Linea and a female of Anthrocera Filipendulæ, which he had taken *in copulâ*, and which was confirmed by Mr. J. B. Lynch, who also saw them in that state; he kept the Anthrocera alive for some time, in the hopes of getting ova, but was doomed to disappointment.

Strophosomus limbatus feeding on Rhododendrons.

The Secretary read the following letter, addressed to him by Mr. Charles Noble, of Bagshot Nursery, dated August 19th, 1859:—

"Sir,—I trust you will pardon the liberty I take in sending the enclosed insects to you; they are doing me an immense amount of injury by eating the leaves of young Rhododendrons, and it appears to me they will destroy some thousands if a remedy cannot be found to destroy them. Could you favour me with its name, its mode of life, how and where its eggs were laid, and if any known remedy can be adopted to destroy it?"

Mr. Janson observed that the insects sent were Strophosomus limbatus, a Curculio common on heath, and therefore doubtless abundant in the immediate neighbourhood of Mr. Noble's grounds; and the President remarked that it was scarcely to be wondered at that the insect should attack Rhododendrons, which belong to the same natural order of plants as heaths.

Bees drinking from a Chalybeate Spring.

Mr. Tegetmeier stated that when recently at Blechynden, near Southampton, he was informed that the bees in the neighbourhood resorted almost exclusively to one particular spring, or deep open cutting dug for draining: on examination, he found that the water was strongly impregnated with iron, evidently derived from the decomposition of iron pyrites. He noticed that the bees congregated in the greatest numbers at the head of the cutting, drinking the water as it issued from the ground, before it had deposited any of the iron as peroxide. There were numerous other open cuttings in the field, the water in which was not impregnated with iron, and they were not frequented by the bees. The fact of bees preferring a chalybeate spring had not, he believed, been previously noticed.

Mr. Pascoe stated that the collection of insects of all orders belonging to the United Service Museum was to be disposed of by private contract.

October 3, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Journal of the Royal Agricultural Society of England,' Vol. xx. Part 1; presented by the Society. 'Tijdschrift voor Entomologie uitgegeven door de Nederlandsche Entomologische Vereeniging,' Vol. iii. Parts 3, 4 and 5; by the Entomological Society of the Netherlands. 'Journal of the Proceedings of the Linnean Society,' Vol. iv. No. 14; by the Society. 'Farm Insects,' Part 5; by the author, John Curtis, Esq., F.L.S. 'Exotic Butterflies,' Part 32; by W. W. Saunders, Esq., F.R.S. 'The Zoologist' for October; by the Editor. 'The Journal of the Society

of Arts' for September; by the Editor. 'The Literary Gazette' for September; by the Editor. 'The Athenæum' for August; by the Editor. 'A Manual of British Butterflies and Moths,' Vol. ii.; 'The Entomologist's Weekly Intelligencer,' No. 157; 'The Natural History of the Tineina,' Vol. iv.; by H. T. Stainton, Esq. 'Bijdragen tot de Dierkunde uitgegeven door het Koninklijk Genootschap Natura Artis Magistra te Amsterdam.' Part 7; by La Commission du Jardin Zoologique d'Amsterdam. Four specimens of Pterophorus Loewii; by the Rev. O. P. Cambridge.

Election of a Member.

The Baron Maximilian de Chaudoir was balloted for, and elected a Member of the Society.

Exhibitions.

Mr. Stevens exhibited a specimen of Pieris Daplidice, taken by Mr. Shickle on the Kentish coast.

Mr. Bond exhibited specimens of Laphygma exigua and Heliothis armigera, taken at Freshwater; also single examples of Noctua flammatra and Leucania extranea, from the same locality; these two last-mentioned species being additions to the list of British Noctuæ, and the latter especially remarkable as not being hitherto recorded as an European insect, although found in various parts of America, Asia and Australia.

Mr. Bond also exhibited, on behalf of Mr. Matthews, a specimen of Aspilates sacraria, taken by him in Devonshire; and on the part of Mr. Lynch, a fine specimen of Acidalia rubricaria, taken in Kent.

Mr. Smith exhibited a specimen of Aspilates sacraria, taken on Banstead Downs, on the 22nd of August last; and a number of the original drawings of the illustrations of Roesel's 'Insecten Belustigung, lent to him by Dr. Gunther.

Dr. Allchin exhibited a specimen of Lycæna bœtica, taken near Brighton on the 7th of August last, and the first known instance of the occurrence of the species in Britain; and an example of Leucania extranea taken near Lewes on the 9th of September. He also exhibited specimens of Coremia ferrugata and the variety called unidentata by Haworth, taken *in copulâ*.

Dr. Allchin also exhibited beautiful drawings of Lycæna bœtica and Leucania extranea, made by Mr. W. S. Coleman.

Mr. Stainton observed with reference to the occurrence of L. bœtica in England, that the species is usually rare in the north of Paris, but this season it had been very abundant in the north of France, and also in the Channel Islands; it was not, therefore, to be wondered at that it should have reached our southern coast.

Mr. Stainton exhibited a specimen of Pterophorus brachydactylus, taken in Cumberland by Mr. Hodgkinson; this being the second British specimen of the insect, of which a single specimen had occurred in Norfolk more than twelve years ago.

Mr. Stainton exhibited a drawing of a new species of Lithocolletis (L. Helianthemi) with a cocoon of the insect; the habit of this species was altogether abnormal, as the larva, which mines the under side of the leaves of the Helianthemum vulgare, quits the mine to undergo the change to the pupa state, and forms a flattish, white cocoon, very similar to those formed by some larvæ of the genus Gracilaria. The perfect insect has considerable resemblance to L. sylvella, and, despite the habit of the larva, appears to be a veritable Lithocolletis. Mr. S. has received the drawing and cocoons from Herr Hofmann, of Ratisbon.

Mr. F. Moore exhibited the larvæ of the Eria moth, of Bengal (*S. Ricini*, Boisd.), and of the hybrid between it and the Eria of China (*S. Cynthia*, Drury), reared from eggs received from M. Guerin-Menéville. The larvæ have been fed on the castor-oil plant (*Ricinus Palma-Christi*).

Mr. Gorham exhibited some Coleoptera taken near Westerham, including Amara ruficincta, Tetratoma Desmarestii and Philonthus thermarum; also Stenolophus Skrimshiranus, from Hammersmith.

Mr. Trimen exhibited a further portion of the entomological collection made by him in South Africa, and part of which had been exhibited at the September meeting of the Society; amongst the Lepidoptera were some splendid Hepialidæ and Zygænidæ.

Dr. Knaggs exhibited some specimens of a species of Ino, which he considered might be distinct from the known British species, Ino Statices and I. Globulariæ: he also exhibited a singular mass of cocoons found on a twig of the Virginian creeper, at Kentish Town, which Mr. Westwood pronounced to be the cocoons of Microgaster alvearius.

Mr. Janson exhibited a specimen of Emus hirtus, taken at Southend by Mr. Haward; and an example of the true Anchomenus elongatus, *Dejean*, taken by Mr. Brewer at Southwold, Suffolk,—the specimen, which is unique as British, now belongs to the collection of Mr. Jeakes.

Mr. Janson read some extracts from Henry Mann, Esq., of Mercarra in Coorg, Madras Presidency, respecting a species of Coccus, which has done much injury to the coffee plantations in that part of India.

Mr. Mitford stated that he had recently captured a single larva of Deilephila Euphorbiæ in the Isle of Wight.

The Larvæ of the Gnat.

Mr. Westwood read a letter from Mr. Swan, which stated that whilst trying some experiments in bleaching materials for paper, he had occasion to use some rain-water swarming with the larvæ of the gnat. Wanting to make some strong alkaline ley, he put 2 oz. of soda (used for washing) with 2 oz. of quick-lime into a pint of the water, whereupon the larvæ darted about as usual, and did not appear in the least inconvenienced after the soda was dissolved and the lime slacked, nor did they succumb till the water was placed over a fire to be boiled. Knowing that chloride of lime was very destructive in killing fish (from seeing the effects of the spent liquor thrown by the paper-makers into the river, after having used it for bleaching their pulp), he tried the effect of it upon these larvæ in two quarts of water, in which over 1 lb. of bleaching salts (or chloride of lime) was thoroughly dissolved, and which was so strong that after stirring it up with the hand he was obliged to anoint it with some oil to take off the injurious effect produced upon the skin; these larvæ, however, seemed quite at home and comfortable, if anything a little more lively, even after having been in the liquor an hour and a half.

Observations on Sitaris humeralis.

Mr. Smith read some remarks on Sitaris humeralis by Mr. Stone, in which the writer, after stating that his attention had been directed to these insects on some old walls in the neighbourhood of Brighthampton, by a paper by Mr. J. W. Douglas, published in No. 149 of the 'Entomologist's Weekly Intelligencer,' observes:—

"On the 17th of August the insect made its first appearance this season, and in the course of that day I secured seven specimens. On the following day I obtained four more, and on the third and fourth days a couple of dead ones. Not a single specimen was to be met with from this period till the 3rd of September, when the insect again appeared, and this time in great profusion. I procured that day upwards of thirty specimens, and they have been coming out daily, in numbers apparently varying somewhat, according to the temperature, from that time to the present (September 27th).

"When the insect first began to appear in the winged state I set about exploring the cells of the bee upon which it was said to be parasitic. In doing this I obtained three or four larvæ just about to become pupæ. The change from one state to the other reminded me more than anything else of a 'dissolving view.' First, there was a distinct picture in the shape of a white, fat larva; presently an obscurity began to extend itself over the picture, gradually becoming more and more dense, and after a while as gradually clearing away, when an entire change was found to have taken place; and instead of a white, fat larva, there was to be seen an amber-coloured object, in shape much like a coffee-berry, loosely enveloped in a semi-transparent covering. Having removed several of these coverings, and examined them with the aid of a powerful lens, they appear to me to be the skins of bee larvæ, and if so, it is clear the Sitaris larva must feed upon the body of the bee larva, living and undergoing its changes inside the latter.

"I obtained a considerable number of pupæ, which were found in groups, each group consisting of from three or four to ten or twelve, and each pupa occupying a cell of the bee upon which the insect is parasitic.

"The perfect insects make their way out of the cells in which they have been bred by gnawing away the mortar or dirt of which they are composed. The females, on emerging, station themselves just outside the cells they have quitted, and there await the coming of the males. They are not in general long without a partner, for by some curious arrangement they mostly contrive to emerge in pairs. Copulation takes place without loss of time, and in a brief space (generally not longer than three or four minutes) impregnation is effected, and the female, without removing from the situation she has been occupying, proceeds to deposit her eggs. They are deposited in immense masses, sometimes in the roof of the cell she has just vacated, or if not there, then in some convenient cranny or crevice immediately adjoining.

"I have observed many instances of females dying, apparently of exhaustion, before they had completed the task of depositing their eggs; and in any case they appear to survive its accomplishment but a very brief period. The males also appear to be almost as short-lived as the females.

"Nature would seem to have given these creatures wings merely by way of ornament, for I have never seen either sex make the least attempt to use them, aërial exercise being a thing they seem never to dream of taking; indeed, they appear to be of the most sluggish habits, rarely, if ever, quitting the wall in which their whole life has been passed, but to it they cling with amazing tenacity, and it requires some degree of force to compel them to loose their hold."

Mr. Smith observed that having examined the "semi-transparent coverings" alluded to by Mr. Stone, which that gentleman had forwarded to him, he was of opinion that they were not the skins of bee larvæ, as supposed by Mr. Stone, but the cast skins of the larvæ of Sitaris.

Mr. Lubbock said that M. Fabre had recently published, in the 'Annales des Sciences Naturelles,' an interesting account of the habits and metamorphoses of Sitaris. After much trouble he convinced himself that the active little hexapod larva, after fixing itself to the body of the bee, patiently awaits the deposition of an egg, at which moment it quits the bee and attaches itself to the fresh-laid egg. After devouring the yolk it swims about for awhile in the empty egg-shell, and then, after undergoing the first metamorphosis, commences to eat up the honey. M. Fabre is so excellent an observer, and his paper is evidently written with so much care, that this statement is probably correct, in which case Mr. Stone must be wrong in supposing that the Sitaris larva feeds on the body of the bee larva. Mr. Stone will be doing good service to Entomology if he is able, in a future season, to confirm the interesting observations made by M. Fabre.

Mr. Westwood stated that he had himself made nearly the same observations as Mr. Stone, on the habits of the perfect Sitaris, many years ago, in a village, in Oxfordshire, when he had found it usually abundant, and had succeeded in rearing the larvæ from the eggs laid by the females. He had since been favoured, by Madame Audouin, with permission to make copies of the extensive series of observations made on the habits and transformations of the same species, by the late lamented Prof. Audouin, which he promised to lay before the Society at a future opportunity.

Part 3 of the current volume of the Society's 'Transactions' was on the table.

November 7, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Proceedings of the Literary and Philosophical Society of Liverpool,' No. 13; presented by the Society. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1858, Nos. 2, 3 and 4; 1859, No. 1; by the Society. 'Farm Insects,' Part 6; by the Author, John Curtis, Esq., F.L.S. 'The Zoologist' for November; by the Editor. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part 18—Pyralides; by the Author, Francis Walker, Esq., F.L.S. 'The Journal of the Society of Arts' for October; by the Society. 'The Athenæum' for September; by the Editor. 'The Literary Gazette' for October; by the Editor. 'Catalogus Hemipterorum, Herausgegeben von dem Entomologischen Verein zu Stettin;' 'Stettiner Entomologische Zeitung,' Nos. 7—9; by the Entomological Society of Stettin. 'The Entomologist's Weekly Intelligencer,' Vol. vi. and Nos. 158—162; by H. T. Stainton, Esq.

Election of a Subscriber.

E. C. Rye, Esq., of King's Road, Chelsea, was balloted for, and elected a Subscriber to the Society.

Exhibitions.

Mr. Waterhouse exhibited, on the part of Dr. Power, two new British species of Coleoptera, viz., Donacia obscura of Gyllenhal, Lacordaire, &c., determined by Mr. Waterhouse; and Philonthus fuscus, *Gravenh.*, determined by Dr. Power. The Donacia was sent to Dr. Power by Mr. Somerville, of Glasgow; it is most nearly allied to D. Lemnæ, but is of an uniform bronze, inclining to lead-colour, has the posterior thighs more strongly dentate; the tarsi longer; the third joint relatively rather longer, the punctures of the striæ of elytra finer; the form of the hinder tibiæ also differs, &c. Of the Philonthus there are two specimens, one taken at Shirley and the other at Merton, in July of the present year.

Mr. Waterhouse then exhibited from his own collection:—

1. A specimen of Philonthus fuscus, *Grav.*, taken by him at Southend, at the beginning of September, 1858; it differs somewhat from Dr. Power's specimens (which have the thorax black, inclining to pitchy behind), in having the thorax red, with the fore-half pitchy; this, it would appear from the descriptions, is the more common colour of the part in question. In all the specimens exhibited the elytra are red, with the apex pitchy. Mr. Waterhouse added that Mr. Douglas has also taken this insect.

2. Tachinus laticollis, *Grav.*, *Kraatz*. Mr. Waterhouse stated that he is indebted to Mr. Constantine for a pair of this insect, which, according to Mr. Constantine, is not uncommon near Blackburn, in Lancashire. He had long searched for this insect in vain, both in the neighbourhood of London and in the New Forest, suspecting, from its range on the Continent, that it would be found here. By Erichson it is regarded as a variety of Tachinus marginellus, but it appears to Mr. Waterhouse that Dr. Kraatz is justified in again separating it as a species. Mr. Constantine, who takes both insects, states that he readily distinguishes them.

3. Tomoxia bucephala, *Costa*, *Mulsant*. = Mordella fasciata, *Payk.*, *Gyll.* Mr. Waterhouse has seen this insect mixed with specimens of the Mordella fasciata, *Fab.*, in several of the London collections. The Tomoxia is distinguished by differences in the structure of the antennæ and by differences in the relative length of the intermediate tibiæ and tarsi; but the most obvious distinction is in the large size and nearly square form of the scutellum, which is emarginate behind. In Mordella the scutellum is small and triangular.

4. Byturus fumatus, *Linn.* Like the preceding, seems to be confounded with a nearly allied species. It differs from M. tomentosus in having the elytra more elongate and the eye much larger; the antennæ also are inserted close to the anterior angle of the eye, whilst in M. tomentosus they are somewhat remote from that organ.

Tenebrio Molitor, specimens having deformities produced by injuries received by the larvæ. One specimen has the thorax shorter and broader than usual, and corresponds most closely with the insect upon which Mr. Stephens founds his Tenebrio laticollis; this type-specimen is evidently deformed. One specimen, exhibited by Mr. Waterhouse, had not the full number of joints to the antennæ, and the joints

forming the club were much deformed, and more or less anchylosed. A second specimen was remarkable only for having one of the hind legs much smaller than the other.

Mr. Stevens exhibited a box of Coleoptera, chiefly Geodephaga, taken in the neighbourhood of Rio, by Mr. Squire.

Mr. Syme exhibited a beautiful drawing of the larva of Sphinx Convolvuli, drawn from Nature by Mrs. Syme; he also exhibited the following Lepidoptera, taken during the past season on the South Coast, viz., Leucania vitellina, Heliothis armigera, Ennomos fuscantaria and Phibalapteryx gemmaria.

Mr. Bond exhibited a fine Phycis, new to this country, taken in Dorsetshire by the Rev. Mr. Green; and a specimen of Ancylocheira fasciata, *Fab.*, found alive in Oxford Street, in July last.

Mr. Janson exhibited a specimen of Hydrochus carinatus, *Germar*, a species new to the British list, one of two taken by Mr. T. P. Dossetor, at the beginning of May last, in Holme Fen, Huntingdonshire; and an example of Mycetophagus quadriguttatus, *Müller* (M. pubescens, *Steph.*), found about three weeks since, by Mr. R. M'Lachlan, in a fungus on an oak, near Beckenham, Kent, and remarked that the present individual, one in the cabinet of the late Mr. Stephens, from the neighbourhood of Portsmouth, and one taken by Mr. Waterhouse, in the corridor of the Crystal Palace, at Sydenham, in April, were the only indigenous examples of this species he had yet seen.

Mr. Stainton exhibited some specimens of Micro-Lepidoptera, collected in South Africa by Mr. Trimen, amongst which was a beautiful Neurophora, which, unlike the known species of that genus, was adorned with elegant markings; some specimens of the genus Coleophora, though in bad condition, were interesting as the first extra-European examples of that genus which had been met with.

Mr. Stainton also exhibited, on behalf of Mr. Birks, of York, a specimen of Anchocelis rufina, with an expanded tuft of hairs inserted beneath the abdomen, on the side of the third segment; a similar brush had existed on the opposite side, but had become detached whilst being microscopically examined. Mr. Stainton said it had been suggested that this was a peculiarity of the male A. rufina, and Mr. McLachlan remarked that he had noticed it in other specimens.

Mr. Trimen exhibited some apparently nondescript Coleoptera and Lepidoptera, from South Africa.

Dr. Allchin exhibited an example of Luperina Dumerilii, taken at Brighton on the 26th September last.

Mr. Pascoe exhibited some longicorn beetles sent from Batchian by Mr. A. R. Wallace, and furnished the following characters of two of the species:—

Cerambyx aureipennis.

C. ater; prothorace elongato, mutico, antice angustato, disco tuberculis tribus nitidis; elytris sericeo-aurantiacis; antennis corpore brevioribus. Long. 8 lin. Batchian.

Tmesisternus lotor.

T. oblongo-ovatus, fulvo-brunneus; capite, prothorace, elytris plagis tribus anticis, fascia post-mediana, maculisque apicalibus flavo-griseis; geniculis nigris. Long. 9 lin. Batchian.

Mr. G. Wailes communicated the following:—

Rhododendrons and their Enemies.

"Mr. Noble's communication, as to the destruction done to his Rhododendrons, reminds me of the doings of the larva of Mamestra Brassicæ amongst mine. Many years ago when the variety was scarce in gardens, these larvæ nearly ate up the whole of the young foliage of a plant of Rhododendron caucasicum album in a very few days, and on detecting the mischief I picked off some dozens of them. Since that time I have occasionally seen marks of their handiwork on the lower leaves of R. ponticum, especially where the branches swept the surface of the turf. This year they have flown at nobler game, and made sad havoc in a house which I have devoted to the growing of the Sikhim and Bhootan species. My collection of these fine plants wants only some three or four to include in it all the introduced species, and consists of more than a hundred plants. I mention this to show that the larvæ had full choice of food before them, whilst their attacks have been confined to the following,—glaucum, barbatum, Maddeni, Hookeri, Windsori and Jenkinsi, and of these the plants were scattered about in different parts of the house, intermingled with the other sorts. I need hardly add that the mischief was done at night, and evidently by larvæ of nearly full growth, as may be seen by the leaves I enclose, and, as I found to be the case, when I managed to capture the offenders. My impression is that a female moth had gained access by the open windows, and had deposited her eggs on some other plants in the house, and I noticed that some young Chinese primroses, &c., had their leaves partially eaten, which I concluded was the work of small slugs, and that it was not till other food failed, or the larvæ had acquired a taste for roaming, that they had recourse to the Rhododendrons. I have also observed that the larva of some Tortrix attacks and twists up the small leaves which terminate the growth of such species as R. Dalhousiæ, Edgworthii and formosum, but have not yet succeeded in rearing the species. The damage is very trifling, as they don't appear to meddle with the dormant buds.

"Another curious circumstance connected with these plants I have noticed as regards the habits of what is termed "the white scale," a species of Aspidiotus. This pest, as is well known to all plant growers, confines its attacks almost exclusively to the under sides of leaves, where it often escapes the vigilance of the gardener. In the case of one of my plants of R. Edgworthii, from a nursery, it had established itself on the upper surface along the midrib, and on the depressed veins caused in this species by the bullate areoles of its beautiful leaves. To this locality it had evidently been driven by the thick tomentum which covers the stems and under sides of the leaves, and so prevents its attaching itself to the surface of the leaf itself. Here, unfortunately for its safety, it at once strikes the eye and is readily destroyed.

"The very young leaves of several of the species have suffered also from the doings of the larvæ of one of the Tenthredinidæ, I think an Athalia, which in summer attacks almost all plants under glass, and seems a general feeder, eating the leaves half through from the under side. This I will endeavour to rear, notwithstanding the almost irresistible inclination one naturally feels to be rid of it, and to ascertain what it really is."

A paper by Mr. S. Stone was read, entitled

Facts connected with the History of a Wasp's Nest; with Observations on Ripiphorus paradoxus.

In this paper Mr. Stone shows that having taken a nest of Vespa vulgaris, and having destroyed the entire community, he placed it in an apartment near to a community of the same species, which he had previously obtained; that members of the latter community at once proceeded to feed the grubs in the stranger-nest, and to construct a covering, which they completed in about a week. At the end of three weeks Mr. Stone found, to his surprise, that the cells were occupied with eggs and pupæ in every stage of growth; and as by that time all the eggs and pupæ in the nest, when first taken, must have been either full grown and spun up, or must have become perfect wasps, it was clear that all those observed in the cells must have been deposited subsequently to the nest, having been taken.

As none of the wasps driven out of the nest when this excommunication took place were queens, all being of the ordinary size of workers, Mr. Stone concludes that the eggs were those of workers, and as the whole brood which were subsequently developed were workers, it appeared that the results went partly to confirm Dr. Ormerod's observations, published in the 'Zoologist,' last August, namely, that workers deposit eggs which produce workers; Dr. Ormerod, however, obtained males as well as workers from a nest which was deprived of its queen. The latter writer having removed a nest from a shrub, found that three or four straggling workers reconstructed the nest, and both eggs and grubs were found in it; this nest was also removed, and a third was constructed by a few workers and eggs deposited in the cells; not one wasp being observed or found in the nest. Mr. Stone also found numbers of Ripiphorus paradoxus, a beetle parasitic in nests of Vespa vulgaris: the discovery was too late in the season for Mr. Stone to observe in what manner the young grub of the beetle obtained its nourishment; one fact was, however, noticed,—that Ripiphorus is covered in the cell of the wasp, in the same way as the pupa of the latter insect, by a silken convex cap.

Mr. Smith observed that doubtless every entomologist was acquainted with the details of Professor Siebold's work on 'A True Parthenogenesis,' in which the wonderful but simple means were detailed whereby the eggs of the queen bee were rendered capable of producing fertile females and workers; and, having read Dr. Ormerod's highly interesting paper on the Vespidæ (Zool. 6641), in which the author apparently proves that worker wasps can and do deposit eggs which develope workers and also males, and having heard in Mr. Stone's paper a strong corroborative case described, he naturally was led to ask the question,—Is the wasp, then, differently organized to the honey-bee? This question he was not in a position to answer.

It did appear, as a thing proved, that worker wasps, without a possibility of copulation, were capable of depositing eggs, and that those eggs developed both workers and males. That no copulation could have taken place was proved by the fact that not a single male was developed until six weeks later in the season. Another question forced itself upon his mind, as to whether parthenogenesis, as detailed by Siebold in reference to impregnation, applied equally to the social Vespidæ as to the social honey-bee; in fact, was it a general law applying to all social hymenopterous insects? The details before the Meeting appeared to give an answer in the negative.

Mr. Smith further observed that, for his own part, he could not, as the question stood, but think that there had been some defective observation, and that further and more close attention to the subject might possibly prove this to have been the case. Dr. Ormerod got over the difficulty by supposing some of the small queens—or large workers, as they in fact are—hybernated throughout the winter, being, like the queens, impregnated the previous season; but to this Mr. Smith could not assent: it was contrary to the observations of all previous observers. He had himself found, during his researches the last twenty years, great numbers of hybernating wasps, but all had been the large queens: he had never known of a single worker having been thus discovered. If worker wasps hybernated, and were capable of continuing their kind, whence any necessity for queen-wasps at all?—*E. S.*

December 5, 1859.

Dr. Gray, President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Genera des Coléoptères,' par M. T. Lacordaire, Tome v., and 'Atlas,' Livraison 1; presented by the Author. 'Monographie des Elatérides,' par M. E. Candèze; by the Author. 'Transactions of the Zoological Society,' Vol. iv. Part 6; by the Society. 'Farm Insects,' Part 7; by the Author, John Curtis, Esq., F.L.S. 'The Zoologist' for December; by the Editor. 'The Proceedings of the Zoological Society, 1859,' Part 2; by the Society. 'The Athenæum' for October and November; by the Editor. 'The Literary Gazette' for November; by the Editor. 'The Journal of the Society of Arts' for November; by the Society. 'The Entomologist's Weekly Intelligencer,' Nos. 163 to 166; by H. T. Stainton, Esq.

Election of Members.

Roland Trimen, Esq., 71, Guildford Street, Russell Square, and Henry Johnson, Esq., 31, St. Mark's Crescent, Regent's Park, were balloted for and elected Members of the Society.

Exhibitions.

Dr. Wallace exhibited some specimens of the Coquilla nut from South America, the kernels of which had been eaten by the larva of Bruchus Bactris, of which he also exhibited examples.

Mr. Janson stated that he had had the larva of this species alive for the last five months.

Dr. Wallace also exhibited some specimens of Myrmica domestica, which he had lately found in great numbers in his own residence: as this was in the immediate

neighbourhood of the British Museum, he thought the authorities of that establishment ought to take every precaution to prevent it from obtaining an entrance therein, as it appeared to be impossible to exterminate them when they once obtained a lodgment, the nests apparently being situated in the foundations of the houses.

Mr. Baly exhibited a fine new Hispa, sent from Batchian by Mr. Wallace, and read the following description of it:—

"Oxycephela imperialis.

"Elongata, subdepressa, pallide fulva, nitida; antennis (basi excepto) piceis; thorace transverso-quadrato, basi ad apicem paullo ampliato, crebre punctato; elytris postice attenuatis, metallico-cyaneis, apice externo rufis, fascia lata obliqua, vix ante mediam posita, extrorsum abbreviata, pallide fulva. Long. 7 lin.

"Hab. Batchian."

Mr. Stainton exhibited a specimen of Margarodes unionalis, a species new to Britain, taken by Mr. King, at Torquay.

Mr. Fereday exhibited a beautiful series of Sphinx Convolvuli, captured this season; and a variety of Colias Edusa, having the central spot on the anterior wings much suffused on the under side.

Dr. Knaggs brought for distribution amongst the members a number of specimens of Amara plebeia, found in his own field at Kentish Town.

Mr. Tegetmeier exhibited specimens of Apis ligustica, of which he had lately received living examples of the queen and workers from the Continent, where it is considered a more profitable species to the owner than the common honey bee; he hoped, during the next season, to test the correctness of this opinion.

Mr. Stainton read a paper "On the Geographical Distribution of British Butterflies."

Some conversation ensued on the probability that the few examples of Vanessa Antiopa, Argynnis Lathonia, &c., which are found in this country, are specimens bred on the Continent, and flown across the channel during favourable weather. Mr. Waterhouse observed that whilst crossing from Liverpool to Dublin in a steamer, a few years ago, on a remarkably calm day, when the sea was as smooth as glass, he noticed the surface of the water was literally covered with butterflies and other insects, which seemed to keep pace with the steamer; thousands of them must have crossed the channel that day: he was convinced that the powers of flight possessed by insects could hardly be over-estimated.

The Secretary read a paper by Mr. Wallace, intituled "Notes on the Habits of Scolytidæ and Bastrichidæ," in which the author expressed his opinion (founded on extensive observations of the habits of those insects in the islands of the Eastern Archipelago) that they only attack trees which are already in a diseased or dying state.

January 2, 1860.

J. O. Westwood, Esq., F.L.S., in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Transactions of the Linnean Society,' Vol. xxii, Part 4; 'Journal of the Proceedings of the Linnean Society,' Vol. iv. No. 15; presented by the Society. 'Exotic Butterflies,' Part 33; by W. W. Saunders, Esq., F.R.S., &c. 'The Entomologist's Annual' for 1860; by the Editor, H. T. Stainton, Esq. 'The Zoologist' for January; by the Editor. 'The Athenæum' for November and December; by the Editor. 'The Literary Gazette' for December; by the Editor. 'The Journal of the Society of Arts' for December; by the Society. 'Descriptions of some Asiatic Lepidopterous Insects belonging to the Tribe Bombyces,' by Frederick Moore, Assistant to the Natural-History Department of the Museum, India House; by the Author. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part xix. Pyralides; by the Author, Francis Walker, Esq. F.L.S., &c. 'Catalogue of British Coleoptera,' sheets H and I; by the Author, G. R. Waterhouse, Esq., F.Z.S.

Election of a Member and Subscribers.

J. W. May, Esq., 19, Clifton Road, St. John's Wood, was balloted for and elected a Member of the Society; and R. G. Keeley, Esq., 11, Sydney Terrace, Marlborough Road, Chelsea, and W. G. Pelerin, Esq, 28, Hertford Road, De Beauvoir Square, were elected Subscribers to the Society.

Exhibitions.

Mr. Samuel Stevens exhibited a large box of insects of various orders, sent from Siam by M. Mouhot.

Mr. Groves exhibited a specimen of Libellula pectoralis of De Selys, a dragon-fly new to Britain, taken in June near Sheerness.

Mr. Westwood exhibited a small Lepidopterous larva with eight ventral and two anal prolegs, preserved in spirits, which he had received from a correspondent, who, whilst asleep, was aroused by a smart bite inflicted on his instep, and who, on examination of the part affected, discovered the larva exhibited. Mr. Westwood observed that although some Lepidopterous larvæ were known to be carnivorous, and many species in confinement would devour other larvæ, yet, taking for granted that the larva exhibited was the real culprit in this case, this was the first instance he had heard of their attacking the human species. The larva appeared to be that of one of the Tineidæ, but there was no appearance of a case in which it might have resided.

Mr. Westwood also exhibited an elytron of a beetle (*Broscus cephalotes*) received from Sir C. Lyell, who had sent it to him as that of a "fossil" beetle, having been obtained from Mundesley, in Norfolk, from a formation containing fish remains (as Agassiz determined them) of extinct species, although associated with recent shells. Mr. Westwood, however, had no doubt that the elytron was a recent one, and it was not difficult to account for it being found in such a situation, as the species is common under marine rejectamenta on the coast, and it might readily be supposed that the

working of worms might have carried down so small an article as the elytron of a beetle. The fact, however, possesses a certain interest in connexion with that of the flint arrow-heads in the drift, which is attracting so much attention at the present time.

Dr. Allchin exhibited a small flask, constructed of brass, for introducing small quantities of chloroform into pill-boxes containing Lepidoptera, for the purpose of killing them; he and others had experienced much inconvenience in using chloroform for this purpose when engaged in collecting, and the instrument exhibited was calculated to remove all difficulty, as by means of it a single drop could be introduced into a pill-box without any risk of spilling or evaporation.

Part 4 of the current volume of the 'Transactions,' recently published, was on the table.

Anniversary Meeting, January 23, 1860.

H. T. Stainton, Esq., F.L.S., Vice-President, in the chair.

The Chairman read a letter from the President of the Society, Dr. Gray, stating his absence was caused by indisposition.

Messrs. J. W. Douglas, W. W. Saunders, F. Walker and J. O. Westwood were elected Members of the Council, in the room of Messrs. J. S. Baly, F. P. Pascoe, F. Smith and G. R. Waterhouse.

J. W. Douglas, Esq., was elected President; S. Stevens, Esq., Treasurer; and Messrs. Edwin Shepherd and Edward W. Janson, Secretaries.

The Chairman delivered an address on the present state and future prospects of the Society and Entomology, for which the Meeting passed a cordial vote of thanks.

Mr. Saunders, one of the Auditors of the Treasurer's accounts, read an abstract thereof, and congratulated the Meeting on the favourable state of the Society's finances.

The Report of the Library and Cabinet Committee, adopted by the Council as its Report to the Society, was read and received.

A vote of thanks was passed to Dr. J. E. Gray, the retiring President, for his services to the Society during his period of office.

A vote of thanks was also passed to the retiring Members of the Council.

THE ANNIVERSARY ADDRESS.

Gentlemen,

Owing to the absence of our excellent President, who, I am sorry to say, is suffering in health, I have been asked to make a few observations this evening on the affairs of this Society and of Entomology in general during the past year.

It is scarcely necessary to inform the Members now present that our Meetings have been well attended during the past year; they have been *too* well attended for the size of our room. However pleasing it may be to us to see an increasing interest taken in the Meetings of this Society, that pleasure is at present not unalloyed with pain: head-ache, throbbing temples and the extreme discomfort caused by breathing for some time a vitiated atmosphere, are the penalties to which we are subject for the attractiveness of our favourite Science. We number amongst our ranks many medical men, and I am sure all will agree with me that the monthly crowding together of entomologists in a space unfitted for their numbers must be deleterious. It might be that were this state of things continued indefinitely, many of our Members would succumb in this new struggle for existence, and those entomologists best fitted to breathe our vitiated atmosphere would have advantages over their fellows, and would become the favoured race; and supposing they transmitted these qualifications to their descendants, it *might* happen, in the course of a few hundred years, that a race of entomologists would be produced who would positively feel uncomfortable unless in rooms crowded to suffocation; but whether the probability of this consummation be great or not, I think it points to a period too remote to be immediately applicable to the present assembly.

I am aware that there are difficulties in the way of moving a Society which possesses a Library so extensive as ours: the expense of our

removal must necessarily be a considerable item. But yet I feel convinced that if a suitable locality could be found with a meeting room at least twice as large as this, the Society would soon derive the benefit from the increase in its Members, more than sufficient to repay the expenses of removal. I say a room at least twice as large as this, because if we are to move, I think we ought to take a lesson from the case-making larvæ of the genus *Coleophora*, and these larvæ when they find their case too small and have to construct a new one, make it more than twice the size of the old one, so that it may at least last for a considerable time; these larvæ do not like to be always making cases, and we, as a Society, do not wish to be always moving.

During the past year we have added fifteen gentlemen to our ranks, ten of whom have been elected Members and five Subscribers. In the same period we have lost fourteen—three Members by death, and five Members and six Subscribers have resigned. It will thus be observed we have now two Members more than last year, and one Subscriber less; this is clearly a gain on the side of the Society.

Amongst our losses the latest, but not the least, is that of our highly esteemed Honorary Member, Mr. Spence. The name of Spence is so indissolubly connected with Entomology, and the Science has benefited so largely by his labours, that we owe no common debt of gratitude to his memory. William Spence was born in 1783, and in the early part of his life he resided at Hull. When about ten years of age he imbibed a slight taste for Botany, from being then under the charge of a clergyman who had himself a fondness for that study, and, to use Mr. Spence's own account of the circumstance,* "I was led from mere boyish imitation to collect and dry plants and to copy out the names of the Linnean classes and orders. This was the sole extent of my then botanical acquirements, which were wholly interrupted by going to another school; and for the seven or eight subsequent years I never looked at a plant. But the germ was there, and old associations having led me to purchase at a book-sale a copy of the Lichfield translation of the 'Systema Vegetabilium,' with a preliminary explanation of botanical terms, I was induced first to study these and then other introductions to the Science, till Botany became an object of my ardent pursuit, and was followed (as in Mr. Kirby's case) by Entomology, when the plants in the neighbourhood of my residence were exhausted."

* Address delivered at the Anniversary Meeting of the Entomological Society of London, January 22, 1849, by William Spence, F.R.S., President.

It was not till the year 1805 that Mr. Spence turned his attention to the subject of Entomology, and the order then to which he then devoted himself was the Coleoptera. His first letter to Mr. Kirby, written within six months of his entering upon this new field of study, shows a vast amount of observation and of critical acumen. In those days the literature of Entomology was less voluminous than it now is; and the few standard authors on a group were more thoroughly studied. Mr. Kirby, whose curiosity in regard to Mr. Spence had already been excited by the sight of some letters which the latter gentleman had written to a mutual friend, Mr. Marsham, was well pleased to enter on a correspondence with so promising an incipient, "who, so far from falling into the errors usual with beginners, determined his species with the judgment and precision of the most experienced naturalist."

In June of the following year Mr. Spence visited Mr Kirby at the Rectory at Barham, and from that time they corresponded continually, and the mutual friendships formed lasted through life. In 1808 the idea of the popular 'Introduction to Entomology' was first broached by Mr. Spence, and being warmly taken up by his older friend was successfully carried out, though so many books had to be read through with the view of collating curious observations, that a longer time was consumed in the preparation of the work than could have been anticipated in the first instance, and it was not till the spring of 1815 that the first volume appeared.

A work that is to live for many years needs a slower process of birth than ephemeral productions.

In 1818 Mr. Spence was subject to severe head-aches, which caused an interruption to his entomological pursuits: he was ordered to lock up his books and cabinets, and to be "for several years an idle man," and he quitted Yorkshire with his family for the more genial climate of Exmouth, where he remained several years; but his health being still far from reestablished he removed to the Continent in 1826, visiting in succession most of the European capitals, and residing four years in Italy.

In 1833 Mr. Spence took considerable interest in the formation of this Society, and at the first Meeting of the Society, in November of that year, he was elected an Honorary English Member, and the bye-laws expressly stipulated that no resident in Great Britain could be an Honorary Member, except Mr. Kirby and Mr. Spence. Since Mr. Kirby's death, in 1850, Mr. Spence has been our sole Honorary English Member.

Mr. Spence contributed several notices to the early Meetings of this Society, and in April, 1834 read some "Observations upon a mode practised in Italy of excluding the House Fly from Apartments," which was published as the first paper in the first volume of our 'Transactions.'

In the year 1847 Mr. Spence was elected President of this Society, and it was very much owing to his exertions during the period that he occupied the chair that we recovered from the extreme depression, both in numbers and in funds, under which we were suffering at that time. He continued very regularly to attend our Meetings till about six years ago, when an increasing deafness prevented him from deriving amusement from our discussions, but his interest in Entomology suffered no abatement, and any one who wanted his counsel on any point connected with the Science was sure that it would be heartily rendered. He had always a kind word of encouragement, and was ready even to go considerably out of his way to render a service to his friends.

So few years have elapsed since Mr. Spence was himself contributing notes to the obituary notice of Mr. Kirby that we are apt to overlook the difference in age between Kirby and Spence. Mr. Kirby was ordained the year before Mr. Spence was born; in short, he was 24 years his senior. Mr. Kirby died in the fulness of years, at the age of 91. Mr. Spence survived his coadjutor ten years, but died at the age of 77. His loss will long be felt by this Society, and by Entomology in general.

Another loss we have to deplore is that of Dr. Horsfield, who had the charge of the zoological treasures at the Museum of the East India House.

Fifty years ago Dr. Horsfield was located in Java, and from the years 1809 to 1816 he was actively employed in collecting information with regard to the insect inhabitants of Java and the neighbouring islands. Dr. Horsfields' own account of his doings at that time is too interesting not to merit a place here.

"Early in 1815 I resumed my entomological pursuits with renewed energy. I had now acquired greater experience in collecting: a number of natives had been instructed for affording that assistance which in a hot climate was not only necessary, but greatly conduced to the enlargement of my investigations. I was amply provided with every convenience and facility for preserving what I had collected. Several draughtsmen had likewise been trained, under my super-

intendence, for botanical delineations, and the skill they acquired in those soon fitted them for the annulose department. I was therefore enabled to enter upon a history of the metamorphoses of Javanese Lepidoptera; a design which had long engaged my anxious solicitude.

"Although I did not, at this period, so fully conceive the paramount necessity of an acquaintance with the metamorphoses of Lepidoptera, towards the establishment of a natural arrangement, as I have been led to do in later periods, yet I was so strongly impressed with its essential importance in attempting a complete history of insects, that I commenced with a fixed determination to prosecute the enquiry with unremitted industry and zeal, to collect all the larvæ of Lepidopterous insects which I might possibly obtain, and to trace them through the various periods of their existence. With this view I fitted up a large apartment adjoining my residence with breeding-cages and receptacles for chrysalides. At the commencement of the rainy season, the period when, in tropical climates, the foliage of vegetables is renewed, I daily went out in search of caterpillars, accompanied by the most intelligent of my native assistants. The caterpillars thus collected were placed in separate breeding-cages, and several of the assistants were instructed to provide daily, at regular periods, the food the individuals required, and to secure the cleanliness of the cages. As soon as the individuals were approaching to perfection, a drawing was made of them. The same individual which had been submitted to the draughtsman was then separately confined, watched with the most diligent care, and, as soon as it had passed into the state of a chrysalis, again made the object of the pencil. A determinate number was carefully attached to the drawing and to the cage of the chrysalis. As soon as the perfect insect had appeared and expanded its wings, it was secured, set and numbered in accordance with the larva and chrysalis. During this period every possible solicitude was employed to prevent mistakes; the original series, consisting of the perfect insects and the chrysalides, obtained by this mode of proceeding, and numbered in accordance with the collection of drawings made at the same time, is now deposited in the Museum of the Honourable East India Company, and affords an authentic document of the accuracy of the details regarding the metamorphoses of Javanese Lepidoptera.

"During this process, the food, the date of appearance, the peculiarities, as far as regards the abundance or the scarcity of

the species bred, were carefully recorded, with the intention of forming a regular 'Raupen-Calendar,' according to the plan of Schwarz, as well as for the purpose of contributing to a general Calendar of the Fauna and Flora of the Island of Java."

Having continued this mode of research for two seasons, the labours of Dr. Horsfield were unexpectedly terminated by the transfer of Java to another European power, and Dr. Horsfield returned to England with this valuable collection of Javanese insects.

In this country he was soon engaged in preparing for publication the results of his studies amongst the Lepidoptera of Java, and in 1828 there appeared the first part of a 'Descriptive Catalogue of the Lepidopterous Insects contained in the Museum of the Honourable East India Company.' Of this work, which was originally intended to be completed in six parts, only one other part appeared, and that was published in 1829. Dr. Horsfield subsequently remarked that "It had been undertaken on a plan which could not ensure public support, and was discontinued after the publication of the two first numbers."

In 1857 Dr. Horsfield brought out, with the assistance of Mr. Frederic Moore, a 'Catalogue of the Papiliones and Sphinges in the East India Company's Museum,' forming the first volume of a Catalogue of the Lepidoptera contained in that rich collection. Dr. Horsfield was then upwards of eighty years of age, and the second volume, treating of the Bombyces, was not destined to appear under his own auspices; but we trust that volume is in a forward state, and will not be long delayed.

Dr. Horsfield was one of the original Members of this Society, and one of our first Vice-Presidents, but I am not aware that he frequently attended our Meetings, though I find that, in 1834, he took part in a discussion as to the most effectual mode of destroying ants in houses,—a subject which you will remember was but very recently again brought before us.

The third Member who has been removed from us by death is Mr. John Garland, of Dorchester.

Mr. Garland had for some years devoted much of his spare time to the pursuit of Entomology, and when I was preparing the 'Manual of British Butterflies and Moths,' he supplied me with information as to the Butterflies, Sphinges and Bombyces occurring in the neighbourhood of Dorchester. He came up to London for

medical advice two years ago, and was on several occasions present at our Meetings.

Having now brought to a close the most solemn part of my address, let us turn our attention for a few moments to the losses we have sustained by the withdrawal of Members, and to our consequently relative position compared with this time last year.

I have already mentioned that we have now two Members more and one Subscriber less than at our last Anniversary; but our excellent Secretary, Mr. Shepherd, who has so kindly supplied me with the materials wherewith to construct a report of our state of being, has called my attention to the fact, that our list of losses has been swollen by two or three old defaulters and absentees, whose names have now been erased from our lists, and one gentleman, in reply to a recent reminder of his arrears, politely informed us that he ceased to belong to the Society when we resolved to part with the Exotic Collections, but as he had not then the courtesy to inform us of this fact we have only expunged his name during the past year. Looking at our gains and losses in a commercial point of view, we may say that we have exchanged thirteen guineas of *bad and doubtful* subscription for fifteen guineas which are thoroughly good, and I am thankful to say that I can congratulate the Society on the list of good men and true who have joined our ranks during the past year. It is also interesting to bear in mind the large proportion of new *Members* that we have elected; it has frequently happened that we have elected two Subscribers for one Member in former years, but now this state of things has been reversed, and we have elected during 1859 two Members for each Subscriber. Members we find, in point of fact, to be more permanent than Subscribers; a Member will generally have *determined* to be an entomologist; a Subscriber will frequently be doubtful in his own mind whether he shall devote himself to the pursuit of our Science or not. It may be that we thus obtain as Subscribers some who would never have become Members; but, on the other hand, many who are now Subscribers would certainly have joined us as Members had the inferior class not been open to them. I trust our Subscribers will bear in mind that they can at once be proposed as Members, if they wish it, and thereby become eligible to the offices of the Society, and the only extra drain upon their purses will be the admission-fee of two guineas.

This leads me to the consideration of our financial state. You

are aware that at this time last year, owing to the sale of our Exotic Collections, we had in hand a heavy balance of cash. This balance we have contrived to reduce; £100 has been invested in the Funds, and £70 has been expended in making additions to our Library.

Our income during the past year amounts to £181 11*s.* 7*d.*; our expenditure (exclusive of our investments already mentioned) to £204 4*s.* 2*d.*, leaving, at first sight, a balance on the wrong side of the account of about £22 12*s.* 7*d.* But you are aware that the Council came to a resolution this time last year to furnish the 'Transactions' gratis to all the Members and Subscribers, whether residing in the country or in the metropolis, though by so doing it was calculated that we should suffer an immediate loss of about £15 a year; at the same time it was determined to raise the price of the 'Transactions' to the public, so that the four quarterly parts should cost very nearly as much as our annual subscription; now, having some conscience, we felt that we could not double the price of our quarterly parts unless we increased their size, and thus we have been led to incur a larger expense for the 'Transactions' than usual, and these circumstances combined will more than account for increase of expenditure over income.

And further I may mention that one of our Members has, since I entered this room this evening, handed to our Treasurer a cheque in payment of the amount of the colouring of his plates of the Erycinidæ, which will almost swamp this deficiency, so that I may congratulate you on the fact that, in spite of our giving away our 'Transactions,' and in spite of our increased printer's bill, both sides of our account balance; and our very excellent Treasurer has at this moment, even after meeting every liability we have incurred, a balance of £39 3*s.* 2*d.* in hand, and a certain amount of arrears of subscription (say £10 10*s.*) is confidently to be reckoned upon as good. We therefore commence the new year with most cheering prospects; accounts balancing, cash in hand, library increased, property in the Funds, Members increasing — everything seems *couleur de rose*, except this small apartment, wherein we are

"Cabin'd, cribbed, confined."

During the past year there have appeared four parts of our 'Transactions,' containing papers by Mr. Bates, Mr. Pascoe, Mr. Moore, Mr. Waterhouse, Mr. Saunders, Mr. Smith, Mr. Baly, Mr. Westwood and Mr. Walker.

Mr. Bates has contributed some useful notes on the habits of

South-American butterflies. Mr. Bates' long residence on the banks of the Amazons has afforded him unusual opportunities of studying, year after year, the habits of the same species, and such contributions to entomological literature possess a value for all time.

Mr. Pascoe has contributed another paper "On New Genera and Species of Longicorn Coleoptera," embracing many of the novel forms discovered by Mr. Wallace in the Aru Islands.

Mr. Moore has furnished us with a Monograph of the Genus Adolias, in which fifty-two species are described: this memoir is illustrated with seven plates, in which thirty out of the fifty-two are figured.

Mr. Waterhouse has contributed four papers on the Coleoptera of this country; the first on the species of *Elateridæ* in the Stephensian Cabinet, the second being a revision of the British species of the genus *Corticaria*, in which all the species are very carefully described, and their distinctive characters pointed out,—such monographs of genera are highly useful; the other two papers treat on *Heterocerus* and *Lathridius*.

Mr. Saunders has contributed some descriptions of new species of the genus *Erycina*, which forms a Supplement to a paper by the same author on the subject ten years ago, which appeared in the fifth volume of our first series of 'Transactions.' The present paper is illustrated by two plates.

Mr. Smith has enriched our pages with "A Contribution to the History of Stylops," enumerating the species which are subject to the attacks of these parasites, and the various parts of the globe in which *Stylopized* insects have been met with.

Mr. Westwood has furnished us with a description of a new genus of *Carabidæ*, which Mr. Bates had met with on the banks of the Amazon.

Mr. Walker's paper is only commenced in the last part of our 'Transactions;' it treats of undescribed Neuroptera in the rich collection of Mr. Saunders.

I do not propose on the present occasion to allude to other entomological papers which have appeared elsewhere during the past year. I undertook at such short notice to prepare an address for this evening that time has not permitted me to obtain as accurate a list of the entomological works published in 1859 as I could have wished, and rather than render an imperfect account I would prefer to render none at all. Suffice it to say that the British Museum has not been

idle, and that several Museum 'Catalogues' on various branches of Entomology have appeared, and papers on Physiological Entomology have been read by Mr. Lubbock before the Linnean and Royal Societies.

The Entomological Societies on the Continent all appear to be flourishing. Belgium and Holland have now each their Entomological Society, and the old rivalry between Austria and Prussia is continued in the scientific emulation of the Entomological Societies of their respective capitals. Yet though Berlin seems to flourish, Stettin is not extinct, and the 'Zeitung' and 'Linnæa' still continue to make their appearance.

One of the beneficial results of the improving prospects of the Central Italian State will, I would fain hope, be a more thorough investigation of the Entomology of that country. Entomologists are still almost unknown south of the Alps and Pyrenees, yet much no doubt of exceeding interest, much to aid us in our attempts at classification, will yet be found even in Europe, when the less known parts are more thoroughly explored.

The subject of Entomology, when we endeavour to reflect on the various forms which occur in the whole globe, even in individual groups of comparatively small extent, is so vast that when from this attempt to grasp comprehensively a single group we turn to the entire order, and then to the whole insect race, we may well feel overwhelmed at the magnitude of the subject, and at the colossal proportions our Science must sooner or later assume. But we attack the giant piecemeal, and the strongest must succumb to the assaults of ever-increasing numbers.

Report of the Library and Cabinet Committee, adopted by the Council as their Report to the Anniversary Meeting, 1860.

During the past year a further portion of the sum realized by the sale of the exotic insects has been invested in the purchase of standard entomological works for our Library, which, together with our Collections, remain in good preservation, with the exception of some injury which, we regret to state, has been inflicted on one of our copies of Curtis' 'British Entomology' and two or three other works, by the extraction of the title-pages (since restored), and in attempts made to efface from them the Society's stamp, by the person who was last year employed in drawing up a Catalogue of the Library, and who, we are grieved to say, abstracted these and other books from our rooms. The injuries above mentioned were committed for the purpose of rendering these books marketable; we have, however, the satisfaction of adding that they have been recovered without any expense being entailed on the Society.

We would direct attention to the present unsatisfactory state of our Collections of British Coleoptera, Hymenoptera, Diptera and other orders, and to the desirability of having them thoroughly re-arranged in conformity with the nomenclature now in use. About six years back several of our Members undertook the reformation and arrangement of the Collection of British Lepidoptera; specimens were solicited and freely presented; the old and worthless examples of the ancient collection were rejected, and an excellent working collection was got together and arranged in the course of a few months; and it appears to us that a similar reform might as readily be achieved in respect to the other orders if a few of our Members would earnestly and unitedly take the matter in hand.

J. E. GRAY.
W. WILSON SAUNDERS.
FRANCIS P. PASCOE.
F. SMITH.
E. SHEPHERD.

Abstract of the Treasurer's Accounts for 1859.

RECEIPTS.

	£	s.	d.
By Balance on hand, January 1st, 1859	266	13	2
„ Arrears of Subscriptions	13	11	0
„ Subscriptions for 1859	101	17	0
„ Admission Fees	16	16	0
„ Composition ditto	10	10	0
„ Tea Subscriptions	7	5	0
„ Sale of 'Transactions' at the Rooms £7 11 6			
„ „ „ at Longmans' 24 1 1			
	31	12	7
	£448	4	9

PAYMENTS.

	£	s.	d.
To paid arrears for 1858:—Rent to Christmas 20 0 0			
Mr. Newman, Printing 11 3 6			
Mr. Dunn, for Oil 3 10 0			
	34	13	6
„ Rent to Midsummer	20	0	0
„ Insurance to Lady-day	2	10	0
„ Curator, for attendance	18	4	0
„ „ Sundry small payments	0	5	10
„ Tea, thirteen Meetings	13	13	0
„ Attendance, Coals, Cleaning, &c.	4	11	0
„ Postage, Parcels, Stationery, &c.	4	3	3
„ Sundries	2	9	6
„ Christmas boxes	0	12	6
„ Printing 'Transactions'	57	3	0
„ „ 'Proceedings'	3	7	6
„ Engraving Plates	14	14	6
„ Colouring Do.	31	10	6
„ Collector's Commission	0	6	0
„ Bookbinding	11	1	8
„ Purchase of Books	20	0	6
„ Altering Shelves in Library	0	10	0
„ Bought £109 14*s.* 9*d.* 3 ℔ Cent. Consols, and Commission	100	0	0
Balance in hand	108	18	2
	£448	14	5

Liabilities and Assets of the Society.

Liabilities.

	£	*s.*	*d.*
Rent to Christmas	20	0	0
Mr. Yates for Plates	0	13	9
„ Dunn for Oil	4	0	6
„ Wilkinson for Printing	6	9	0
Messrs. Williams & Norgate for Books	35	5	3
„ Dulau & Co. ditto...	3	6	6
	£69	15	0

Assets.

	£	*s.*	*d.*
Arrears of Subscriptions, good	10	10	0
Ditto, doubtful £14 14 0			
Add Balance in hand	108	18	2
	119	8	2
Less amounts due at Christmas	69	15	0
True Balance in favour of the Society.....	£49	13	2

February 6, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Zoologist' for February; presented by the Editor. 'Notes on the Silkworms of India,' by Capt. Thomas Hutton; by the Author. 'Synopsis of the known Asiatic Species of Silk-producing Moths, with Descriptions of some New Species from India,' by Frederic Moore, Assist. Museum India House; by the Author. 'Stettiner Entomologische Zeitung,' 1859, Nos. 10—12; by the Entomological Society of Stettin. 'The Journal of the Society of Arts' for January; by the Society. 'The Literary Gazette' for January; by the Editor. 'Farm Insects,' Part 8; by the Author, John Curtis, Esq., F.L.S. 'Nouveau Guide de l'Amateur d'Insectes, par plusieurs Membres de la Société Entomologique de France'; by H. T. Stainton, Esq. 'An Address delivered at the Anniversary Meeting of the Entomological Society of London, on Monday, January 23, 1860'; by H. T. Stainton, Esq. 'Notice of the Presentation of the Hope Collections to the University of Oxford'; by J. O. Westwood, Esq., M.A., &c.

Election of a Subscriber.

Arthur E. Crafter, Esq., of Tokenhouse Yard, was balloted for and elected a Subscriber to the Society.

Exhibitions.

Mr. W. W. Saunders exhibited two fine Orthoptera, a Phasma from New South Wales, and a Gryllus from Peru, both insects being entirely covered with diverging spines.

Mr. Stevens exhibited specimens of a species of Coccyx allied to C. strobilana, *Linn.*, but much larger; he had recently bred them from cones of Conus Benthammiana, received from California.

Mr. Waterhouse exhibited specimens of a species of Bembidium, which he stated he had had in his collection for many years separated as a distinct species, but hitherto had been unable to identify with any description. The insect in question greatly resembles the Leja lampros of our collections, but differs in being shorter and broader, and in having the antennæ entirely black; the legs, moreover, are entirely black, or with a mere indistinct trace of rufo-piceous in the tibiæ; the head is broader than that of L. lampros, the frontal ridge relatively much broader, and the lateral sulci less strong; the thorax is broader and relatively shorter, less contracted behind, the sides more strongly rounded, and here the rounded outline is continued almost to the posterior angle. In B. lampros the side is distinctly sinuated at a greater distance above the angle, and the angle thus becomes prominent and somewhat acute, whereas in the insect exhibited the angle is a right angle; the transverse depression on the back of the thorax is less strongly marked, and the lateral foveæ are smaller; the elytra are shorter, more ovate, and more convex; the striæ scarcely differ, excepting that the punctures are a little less strong.

Mr. Waterhouse has no note of the locality of the original specimens of his collection: he had recently seen the insect in a box of Coleoptera sent by Mr. J. C. Dale to be named, and he had procured two other specimens from a collection which formerly belonged to Mr. Walker, of Mansfield.

Upon a former occasion, in attempting to identify this insect with descriptions, he had considered the account given by Gyllenhal of the colour of the legs in his B. nigricornis was such as to preclude the identification of the present insect with Gyllenhal's; but considering that in other respects the description in the 'Insecta Suecica' agrees with the insect exhibited, he was now inclined to apply the name "nigricornis" to the species, and to suppose that the discrepancy was more apparent than real as regards the colour of the legs.

Mr. Janson exhibited five species of Coleoptera not hitherto recorded as inhabitants of Britain, and made the following remarks concerning them:—

Quedius truncicola, Fairmaire, Faune Ent. Franç. i. 538, 14 (1856). Nearly allied to Q. fulgidus, F., and bearing a very close resemblance to Erichson's var. 3 ("niger, pedibus piceis, abdomine rufo-brunneo basi nigricante"), but from which it may be distinguished by its punctured scutellum. I captured the two specimens exhibited, the only individuals I have yet seen, under bark of elm; one near Tottenham, on the 29th October, 1848, the other near Hampstead about a fortnight since. In the first of these the punctures on the scutellum are so few and ill defined as to be scarcely perceptible.

Haploglossa rufipennis, Kraatz, Naturgesch. d. Ins. Deutschl. ii. 81, 3 (1856). Distinguished from its near ally, H. pulla, Gyll. Eric. Kraatz, by its more parallel form, closer and much finer punctuation, and the colour of the elytra, which are red, with a dark patch in the region of the scutellum, and at the outer posterior angles. Found by Mr. Wollaston in sand-pits on Reigate Common, on the 26th June, 1857, and by myself in brushing in the same place on the 6th July, 1859.

Cryphalus Fagi, Fab. A single individual taken by myself, at Hampstead, on the 31st July, 1859, amongst the refuse of a stack of faggots. The narrow subcylindrical form, long elytra, prominent tubercles or processes on the anterior portion of the thorax, and red legs and antennæ, distinguish this species. Mr. Gorham informs me that he has recently found some numbers of a Cryphalus in bark of beech, at Westerham, Kent, and which will probably prove to be specifically identical with the example now before the meeting.

Cryphalus Abietis, Ratzeb. Two specimens given me by the Rev. A. H. Matthews, by whom they were taken from bark of firs, in the vicinity of his residence at Gumley, Leicestershire. Distinguished by the tubercles on the anterior portion of the thorax being few in number and irregular in their distribution (not in concentric rows), the regular striæ of punctures and the short pubescence of the elytra. The legs and antennæ are red; the club of the latter pitchy black.

Anthicus bimaculatus, Illiger, Schmidt, de Laferté, *var. β.* A single example, given me by Mr. Joseph Chappell, of Pendleton, near Manchester, by whom it was sent up to me, together with a number of other Coleoptera for determination, and who informs me that it was taken during the past summer on the Lancashire coast. Readily distinguished from all the species of the genus yet ascertained as indigenous to

Britain, by its large size, pallid hue and obovate convex elytra. The normal form, that first described by Illiger, has a triangular black dorsal spot on each elytron a little behind the middle, but of this in the specimen exhibited there exists scarcely any indication. M. de Laferté, Monogr. des Anthicites, 149 (1848), remarks "that the individuals from the shores of the ocean are generally paler than those from the eastern countries of Europe, and that those from the coasts of France and Belgium are entirely destitute of the discoidal spot."

Mr. Janson also exhibited the following rare species:—

Philonthus fuscus, Grav. Taken by himself in a boletus on an ash, near Hornsey, Middlesex, on the 19th ultimo.

Oxylaemus cylindricus, Panz., Eric.. Found by Turner about ten days since, in bark of oak in the New Forest, near Brockenhurst.

Tomicus monographus, F. The male, apparently very rare, conspicuous by having the anterior margin of the thorax triangularly produced with the apex recurved; found by Turner at the same time and under the same circumstances as the foregoing. Erichson (Naturgesch. d. Ins. Deutschl. iii. 284, 1845), adds to his description of Oxylaemus cylindricus: "In oaks, rare. Found by Professor Ratzeburg and myself in the burrows of Bostrichus monographus." It is therefore interesting to find the two species associated in this country.

Platydema violaceum, F. Likewise taken by Turner, under bark of oaks, at the same time and in the same locality as the two preceding.

The President remarked that he had himself taken Philonthus fuscus, under bark of trees infested by the larvæ of Cossus ligniperda, and Mr. Shepherd stated that he also had met with this species in similar situations.

Mr. Sealy exhibited a beautiful series of varieties of Colias Edusa, including the white female variety (Helice, *Hub.*), and examples forming links from it to the typical insect: also a specimen of Sphinx Pinastri, said to have been captured by a young entomologist whilst flying about a fir-tree at Romsey, Hants.

The President remarked that, with the exception of the specimens said to have been received by the late Dr. Leach many years ago from the neighbourhood of Edinburgh, there was no record of the capture of this species in Britain, although so abundant in many parts of Europe; he inquired of Mr. Sealy whether there was any likelihood of the specimen exhibited being a foreign example which had been inadvertently placed amongst insects from the locality mentioned.

Mr. Sealy replied that the reputed captor had some time previously visited Switzerland, and there taken a few insects, but he was assured that the S. Pinastri was not one of the Swiss captures; moreover, he (Mr. Sealy) believed that country was not a locality for S. Pinastri.

Mr. Stainton observed that Mr. Sealy was mistaken, as the insect is well known in Switzerland; it was, however, only fair to state that from his knowledge of the habits of S. Pinastri on the Continent, he considered the neighbourhood of Romsey a very likely spot for the occurrence of this species.

Mr. Stevens exhibited specimens of four species of Lomaptera sent from Batchian by Mr. A. R. Wallace.

Mr. Stevens also communicated the following by Mr. A. R. Wallace:—

Note on the Sexual Differences in the Genus Lomaptera.

"Lacordaire says in his 'Genera' that the Lomapteræ offer no sexual distinctions, except slight variations in the legs; and in the generic character he adds 'the fore legs are three-toothed in both sexes or in the females only.' In four species of the genus which I have recently taken in the Gilolo group of islands, I have, however, observed very strongly marked sexual differences, and I have had the good fortune to confirm them by capturing pairs of two species *in copulâ*. These differences are as follows:—

"1st. The males have always a distinct longitudinal furrow or depression on the under side of the abdomen, which in the females is quite smooth or rounded.

"2nd. The males have one tooth less than the females on the outside of the anterior tibiæ. In the two larger species the males have two and the females three teeth; in the two smaller species the males have but one (terminal) tooth, the females two teeth.

"3rd. The pygidium in the males is simple, with the extremity somewhat obtuse. In the females it terminates in a sharp reflexed edge, and in the two smaller species is swollen and compressed above and very concave beneath, while in the males it is a simple ovate cone equally rounded above and below.

"It is probable that these characters exist in all the species of the genus, and may enable persons possessing series of Lomapteræ to pair their specimens. I may here remark that the species of this genus are very closely allied, and at the same time very limited in their range. In Ternate and Gilolo, and in Kaióa and Batchian,—islands only ten or fifteen miles apart,—are found distinct but closely allied species, differing so slightly (although constantly) that they would be infallibly considered as very trifling varieties, if single specimens of each only were examined. Differences of colour exist in specimens from the same locality; while minute differences of form and sculpture mark these representative species of adjoining islands."

Mr. Gloyne read descriptions of some new species of Lema.

Mr. Stainton read 'Descriptions of South-African Tineina collected by R. Trimen, Esq., in 1858—59.'

Mr. Tegetmeier announced the death, on the 31st ult., of Dr. Edward Bevan, of Hereford, one of the original Members of this Society, and author of that well-known work, 'The Honey Bee,' at the advanced age of 80 years.

March 5, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors :—'The Journal of the Royal Agricultural Society of England,' Vol. xx. Part 2; presented by the Society. 'Journal of the Asiatic Society of Bengal,' No. 99; by the Society. 'Journal of the Proceedings of the Linnean Society,' Vol. iv. No. 16; by the Society. 'The Zoologist,' for March; by the Editor. 'Saggio di Ditterlogia Messicana, di Luigi Bellardi, Professore di Storia Naturale,' Part 1; by the Author. 'Mémoires de la Société de Physique et d'Histoire Naturelle de Genève,' Tome xv. 1re Partie; by the Society. 'The Journal of the Society of Arts' for February; by the Society. 'The Literary Gazette' for February; by the Editor. 'The Athenæum' for February; by the Editor. 'The Entomologists' Weekly Intelligencer,' Nos. 171—179, inclusive; by the Editor, H. T. Stainton, Esq. 'Stettiner Entomologische Zeitnug,' 1860, Nos. 1—3; by the Entomological Society of Stettin.

Election of Members.

Dr. Schaum and Mons. Leon Dufour were elected Honorary Members, and Mons. J. Bigot, Vice-President of the Entomological Society of France, of Rue de Luxembourg, Paris, an ordinary Member of the Society.

Exhibitions.

Mr. Stevens exhibited a large box of Coleoptera sent from Batchian by Mr. A. R. Wallace; it contained a vast number of new species, some beautiful Buprestidæ, &c.

Mr. Janson exhibited a box of Coleoptera he had just received from Mr. C. Turner, collected by him during the last few weeks at Rannoch, Perthshire, and remarked that no less than four of the species were not comprised in Mr. Murray's 'Catalogue of the Coleoptera of Scotland,' viz., Xyloterus domesticus, *Linn.*, Tomicus acuminatus, *Gyll.*, Cis Alni, *Gyll.*, and Bradycellus placidus, *Gyll.*

Mr. Dunning exhibited a singular pale Noctua, which had been pronounced by Mr. H. Doubleday to be a variety of Mamestra anceps.

Mr. Dunning also read a letter addressed to him by C. Maurice, Esq., respecting the specimen of Sphinx Pinastri exhibited by Mr. Sealy at the last Meeting of the Society, in which the writer asserted positively that the insect in question was caught by him at Romsey, as then stated by Mr. Sealy.

The Secretary also read a letter addressed to Mr. Sealy by S. H. Maurice, Esq., brother of the before-named gentleman, who had, as mentioned at the February Meeting, taken some moths in Switzerland during the past summer: in this letter the writer states that he feels certain the moth in question was not one of his Swiss captures, but was caught by his brother at Romsey, after his return from Switzerland.

Mr. Westwood made some observations on the usefulness of labelling insects at the time of capture, by which such instances of disputed identity as the present were avoided; he objected to the plan of employing a number referring to a note-book as commonly in use, as, in the event of dispersion of a collection on the death of the owner, such numbers became useless to all but the possessor of the note-book, and indeed instances had come under his notice in which the said book had been lost. He had always employed in his collection tickets bearing an abbreviation of the locality, as Cb. W. for Coombe Wood.

The President feared that Mr. Westwood's plan of abbreviations would be rather perplexing to any one but himself, unless accompanied by an index, which would be open to the same objections as the note-books which he had just condemned.

Some conversation ensued on the claims of Sphinx Pinastri to be considered a British species; during which Mr. F. Walker reminded the Meeting that Mr. Thomas Marshall, well known to many Members present as one of our most accurate observers, had himself seen this insect alive in Cumberland, and had recorded the fact in the 'Entomologist' some years ago.

Dr. Wallace exhibited two examples of Acosmetia caliginosa, taken by Mr. Grimstead in a wood near Ryde, Isle of Wight: he observed that the species had hitherto only been captured in this country in the New Forest.

The Secretary read the following paper by Mr. G. Wailes, of Newcastle:—

The Hybernation of Vespa vulgaris.

"It is very evident that we have a great deal yet to learn about the social wasps, and therefore the following remarks as to Vespa vulgaris may be interesting. Ever since 1829 I have, at intervals, searched the summit of Skiddaw (3022 feet) for specimens of Leistus montanus, and on every occasion have taken out from underneath the loose fragments of the slate perfectly torpid females of this wasp, with the wings, legs, antennæ, &c., precisely in the state in which we find them during winter in the lower lands. Not unfrequently I have met with dead specimens which seemed to have perished in the same dormant state, and been there for a year or two at least. Mr. Smith, in his 'Catalogne of the British Vespidæ,' under this species, states that 'Mr. Wollaston found the female abundant under stones on the extreme summit of Gribon Oernant, near Llangollen, in September, 1854,' adding 'probably hybernating for the winter,' but had evidently forgotten my writing him on the same subject. My visits to the mountain have extended from the latter end of June to the latter end of August, and therefore it necessarily follows either that these specimens of the female wasp were those of the previous year, or that this sex appears much earlier in the season than has been hitherto supposed. But in either case, the question arises why are they torpid during these the hottest months of the year? It is quite true that the temperature at the altitude is below that of the plains, especially during the night, and I have myself been enveloped in falling sleet and snow more than once, both in June and August, though as a rule the Cumberland mountains seldom have a thick covering of snow, and often only a few inches once or twice in a winter. Still, the temperature of ordinary mountains always approaches that of the plains in summer, and one would have expected was in Britain at least sufficiently high to rouse these wasps in their

winter quarters, when every other insect under the same stones was active and stirring, and the air so warm and bright that Larentia salicata and Crambus furcatillus were sporting in the mid-day sun above them. Such, however, was not the case, and when turned out of their snug, dry quarters, they allowed themselves to be handled and put into pill-boxes just as they do in winter. We may therefore ask, when are these sleepers to awake? for as the ground temperature reaches its maximum during the months in which I have met with them, and Mr. Wollaston has found them in a similar state in September, when a declining temperature has set in, we must conclude that for that year all prospect of their subsequent issue from their retreats through the influence of heat is barred. Can this be called hybernation as it is usually understood? Or is there some other cause of torpidity besides mere cold? Or are we to conclude that when once put to sleep in these lofty regions they wake no more unless kindly removed into a milder clime by a stray entomologist, when, as I have always noticed, they become as active as those of the warm lowlands?

"I have searched in vain for the record of similar facts in other parts of Europe, where, doubtless, the same circumstances occur, and therefore I send this note to the Society with the hope of calling the attention of others to the subject."

Mr. Westwood considered that these female wasps had been the founders of colonies in the preceding spring, and after performing their maternal duties, had retired to die in the situations in which they were found by Mr. Wailes.

Mr. H. W. Bates communicated the following:—

Diagnoses of three New Species of Diurnal Lepidoptera belonging to the Genus Agrias, and of one belonging to Siderone.

"Wishing to dedicate one of the grandest new species of Agrias (a genus which he has done so much to illustrate) to Mr. W. C. Hewitson, I send the diagnosis for insertion in the 'Report of the Proceedings of the Entomological Society' for March, preparatory to the figures which Mr. Hewitson will publish in the April part of his 'Exotic Butterflies.' I add the diagnoses of two other new species which will be figured on the same plate, as well as of a species of Siderone, intended to be figured at some subsequent early date. All four species were taken by myself on the Upper Amazons, and belong to the most beautiful productions of that wonderful country. The discovery of the female of one of the species makes the present communication of some importance in a scientific point of view; as the non-appearance of females with the usual Nymphalideous structure of the fore legs in that sex, in the genera Agrias and Megistanis, seems to have excited doubts as to the constancy of that sexual character throughout the whole family, especially as two forms of males have occurred in some species having the usual superficial appearance of the two sexes (*e. g.* in Megistanis Bæotus). But the discovery of the females in the allied genus Agrias shows that the sexual character in the fore legs is precisely of the same nature here as in the rest of the family Nymphalidæ. The four species now characterized will be included in the 'Insect Fauna of the Amazon Valley, Part Diurnal Lepidoptera,' now preparing for publication.

"Agrias Hewitsonius.

"♂. Size of A. Phalcidon (Hewits. Ex. B.) *Above*. Black. Fore wing having at the base a large orange-coloured spot, rounded on its outer edge; followed by a broad belt of dark blue, extending from the costa to very near the hind margin; edged externally by a belt of six pale greenish lunules. Near the apex is a short belt of three dusky white lunules. Hind wings with a large subtriangular spot on the disk, occupying about half the surface, of the same blue colour as the fore wing.

"*Beneath*. Fore wing has an orange-coloured spot similar to the one on the upper side; the apex is of a pale greenish gray; the intermediate part of a dull black. Hind wing: the base to nearly the middle orange, the outer edge of the patch deeply sinuated in the middle. Rest of the wing pale greenish gray; a submarginal line, a central strongly curved macular belt, interrupted at the first median nervule; two short ones across the disk, and two spots in the middle of the cell, black. Between the central and submarginal belts is a row of seven large, equal, black ocelli, having white pupils (double in the anal one) and shining blue irides. Body above rufous-brown. Antennæ black. The female is considerably larger and less brilliant in colour, having also less blue colour on the disk of the hind wing.

"I took four specimens of this distinct species, at Ega, one male and three females. It is a very bold and rapid flyer, similar to the Preponæ and the Apaturæ of the old world. It is attracted, as well as one of the following species, by the sugary sap exuding from certain trees in the forest, where I have seen it feeding amongst a group of Incas and Cetoniadæ.

"Agrias Pericles.

"♂. Very similar in size and outline to A. Phalcidon. The hind wing, both above and beneath, offers not the slightest difference; the fore wing differs as follows: — *Above*. Fore wing black: the basal portion, to about two-thirds the length, occupied by a large spot of a beautiful scarlet colour inclining to orange. This is followed by an oblique belt of five elongated spots of a metallic-green colour, edged on the inner sides with brilliant dark blue. Towards the apex is a narrow belt composed of four small cream-coloured spots.

"I took one individual only of this species, in company with A. Phalcidon, at Villa Nova, in 1854. The specimen has travelled with me from place to place on the Upper Amazons for five years. I have considered it hitherto only an extraordinary variety of A. Phalcidon, but on further experience of the singular way in which species of this genus and of Catagramma differ from each other, I now prefer to consider it distinct. A. Phalcidon was not uncommon at Villa Nova, although I saw not a trace of it at any other locality. It flies high, and I never saw it descend towards the ground. It settled on leaves of trees about fifteen to twenty feet from the ground, in the broad alleys of the glorious forest at that locality, and could only be captured by attaching a long pole to the bag-net.

"Agrias Sardanapalus.

"♂. In size and shape of wings very similar to A. Claudius, of Rio Janeiro. The under surface of the wings does not differ in any way from that species: above,

the colouration is very different. Fore wing black; the basal portion having a large triangular spot (occupying about three-fourths the surface of the wing) of a rich carmine colour, glossed with cobalt-blue, in certain lights. This is followed by a belt of the most beautiful blue colour, leaving only the apex and a narrow outer margin black, the former of which has a short belt of three large indistinct pale spots. Hind wing has the base and the margins narrowly black; the disk entirely of the same rich blue as the belt across the fore wing.

"I took two of this very richly coloured species, one at Ega and one at St. Paulo: one of them is in the collection of Mr. W. C. Hewitson and one in my own. I saw only four individuals during four years' residence and travel on the Upper Amazons.

"Siderone Mars.

"♂. Considerably less in size than S. Ide. The fore wing has the apex more more falcate than in that species; the outer margin much more strongly rounded, leaving the hinder angle indistinct; the hind wing also is shorter.

"*Above.* Deep black, with two clear white spots near the apex. A large oblique belt of carmine crosses the wing from the costal edge to near the hind angle; its costal part dilated towards the extreme base of the wing. Hind wing black. Two conspicuous rounded red spots near the middle of the costal edge. Anal lobe gray.

"*Beneath.* The base and apex of both wings are of a rich rufous-brown. The discal portion is glossy brownish gray, irrorated nearly throughout with rufous-brown. The hind wing has a broad belt across the middle, of a shining ash-colour, spotless. The apex of the fore wing has a belt of white and lilac-coloured spots.

"I only saw one individual of this species, at St. Paulo, near the frontier of Peru. Like all the other species of Siderone and Paphia, it has the rapid flight of the typical Nymphales, and, like them, not easily scared when reposing, pertinaciously returning to the same spot after being driven away. Its near relative, Siderone Ide, so common in the West Indian Islands and Guiana, also occurs in the country, but is very rare."

The Secretary read the first part of a paper by Mr. H. W. Bates, intituled "Contributions to an Insect Fauna of the Amazon Valley."

April 2, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Zoologist' for April; presented by the Editor. 'The Proceedings of the Zoological Society of London,' 1859, Part 3; by the Society. 'Journal of the Proceedings of the Linnean Society,' Supplement to Vol. iv. Botany; by the Society. 'Exotic Butterflies,' Part 34; by W. W. Saunders, Esq. 'The Journal of the Society of Arts' for March; by the Editor. 'The Literary Gazette' for March; by the Editor.

Elections.

Dr. E. Candeze, of Liege, Belgium, was elected a Member; and George Seaton, Esq., of Trinity Square, Brixton, and J. C. Young, Esq., of Redwood House, Bromley, were elected Subscribers to the Society.

Exhibitions.

The President exhibited some specimens of a species of Trogoderma, which had bred in great numbers in rice imported from Akyab, about two years since, and now at Hibernia Wharf, London Bridge; he also exhibited a quantity of the damaged rice in which, he was informed, the larva had increased to a great extent within the last nine months.

Mr. Stevens exhibited some splendid Lepidoptera sent from Batchian by Mr. Wallace, amongst which were beautiful examples of both sexes of Ornithoptera Crœsus, Papilio Ormenus, P. Deiphobus, P. Codrus, and a fine new species allied to P. Peranthus; also a small Hestia, very distinct from any described species.

Mr. Lewis exhibited a damaged example of Telephorus atra, *Linn.*, a species not hitherto recorded as a native of Britain; the specimen exhibited had been taken in Scotland by Mr. John Scott, and determined by Mr. F. Smith and himself, by comparison with continental examples in the British Museum collection.

Mr. Janson exhibited some Coleoptera taken at Rannoch by Mr. C. Turner.

Mr. Westwood observed, with reference to the large species of Bruchus, exhibited at the last December meeting by Dr. Wallace, as infesting the interior of the nut of the Coquilla (Attalea funifera of Brazil), that there appeared from an investigation which he had made with a view to the determination of the species in question, to be considerable confusion in the nomenclature of the species allied to Bruchus Bactris of Linnæus. That name had been given to a species which infests an American palm of the genus Bactris, and which had been first figured by Jacquin in his 'History of Select American Plants,' pl. 170. According to Schönherr, this species and the allied Bruchus Nucleorum of Fabricius are at once distinguished by having the intermediate joints of the antennæ marked on the upper side with a deep oblong impression. It may, however, probably be questioned whether in the absence of specimens reared from the same species of palm, there is sufficient ground for the distinct identification of the Linnean species. In the 'Proceedings of the Entomological Society,' September 4th, 1854, some seeds of the

wax palm of the Brazils, Copernicia cerifera, were exhibited, together with the beetles reared from them. These were purchased by Mr. Westwood at the sale of the Society's exotic collection, and are now in the Hopeian Museum at Oxford. The beetles agreed with Gyllenhal's diagnosis of Bruchus Bactris in Schönherr (i. p. 93).

Latreille's Bruchus curvipes (described and figured by Humboldt, Obs. de Zoologie, p. 158) was obtained from the fruit of a palm near Serullo, in New Spain. It has longer black antennæ, with entire joints. Germar's Bruchus ruficornis infests cocoa nuts brought to Europe,— the fruit, apparently, of a species of Bactris (probably Bactris minor); it differs from Latreille's species in having red fore legs and antennæ, but is given as synonymous with it by Schönherr, without, as appears, sufficient cause.

Sir William Hooker had forwarded to Mr. Westwood a larva of one of these large species of Bruchi found in the interior of a seed of a palm (a species of Astrocaryum from Bahia) which had been received at the Royal Gardens, Kew: the larva differed in no respect from that of the Coquilla nut. Mr. Westwood had also obtained the nut of another kind of palm, in the interior of which was found a perfect beetle, which seems in no respect to differ from Bruchus ruficornis of Germar. Mr. Kirby also possessed a specimen of a large and closely-allied Bruchus, evidently obtained, from its not fully-developed state, from the interior of some nut, also purchased by Mr. Westwood, but having much larger and more strongly-serrated posterior femora. A specimen of the Coquilla-nut beetle itself is preserved in spirits in the Christ Church Museum, Oxford, in company with the nut and its larva. It also seems to agree with Bruchus ruficornis, so as to preclude the necessity of giving it a distinct specific name, until a more detailed examination of the allied species can be made. The species allied to Bruchus ruficornis are distinguished from Bruchus Bactris, not only in the smooth intermediate joints of the antennæ, but also in having the sutural stria of the elytra simple at its base; in the latter species it is accompanied at the base by two very short rows of punctures like an acute V.

May 7, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Fragments Anatomiques sur quelques Elatérides;' 'Fragments Anatomiques sur quelques Coléoptères;' 'Fragments d'Anatomie Entomologique;' 'Note sur l'Absence dans le Nemoptera lusitanica d'un Système nerveux Appréciable;' 'Description des Galles du Verbascum et du Scrophularia, et des Insectes qui les Habitent, pour servir à l'Histoire du Parasitisme;' 'Mémoire sur une nouvelle éspèce de Belostoma (B. algeriense) et Reflexions sur ce genre d'Hémiptères Aquatiques;' 'Recherches Anatomiques sur les Hyménoptères de la Famille des Urocerates;' 'Fragments d'Anatomie Entomologique sur les Buprestides, suivis de la Description d'une éspèce nouvelle de Cychrus d'Espagne;' 'Histoire Anatomique et Physiologique

des Scorpions;' presented by the Author, M. Léon Dufour.' Naturgeschichte der Insecten Deutschlands,' Eister Band, Eiste Häefte; by the Author, Dr. H. Schaum. 'The Butterfly Number of Young England;' by the Author, E. Newman, Esq. 'The Zoologist' for May; by the Editor. 'The Literary Gazette' for April; by the Editor. 'The Journal of the Society of Arts;' by the Society. 'The Athenæum' for April; by the Editor. 'The Farm and Garden,' Vol. ii. Nos. 13, 14 and 15, containing papers on Injurious Insects; by the Author, C. A. Wilson, Corr. M.E.S. 'The Entomologist's Weekly Intelligencer,' Vol. iv. and Nos. 183—187; by the Editor, H. T. Stainton, Esq. 'Die Deutschen Phytophagen aus der Klasse der Insekten,' von J. H. Kaltenbach; by the Author. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' Part xx. Geometrites; by the Author, Francis Walker, Esq., F.L.S., &c. 'Insecta Saundersiana, or Characters of Undescribed Insects in the Collection of William Wilson Saunders, Esq., F.R.S., &c.;' 'Coleoptera Curculionides,' Part ii., by Henri Jekel; by W. W. Saunders, Esq.

Exhibitions.

The President exhibited a living specimen of Homæusa acuminata, found by Mr. Scott in a nest of Formica fuliginosa, at Mickleham, and living examples of Claviger testaceus from the same locality.

Mr. Stevens exhibited a large collection of Coleoptera, made by Mr. H. Squire in the neighbourhood of Rio.

Mr. Janson exhibited some Coleoptera and Lepidoptera sent from Perthshire by Mr. Turner.

Mr. Scott exhibited Bolitobius inclinans, Mycetoporus lucidus and Elachista gangabella, and made the following observations respecting them:—

Bolitobius inclinans, Grav. A single example taken at Coombe Wood. Authors, so far as I am aware, have not observed, or if so not described, the remarkable development of the basal joint of the intermediate tarsi.

Mycetoporus lucidus, Erichs. Only three or four individuals of this species are known as having been taken in England previously. One specimen also taken at Coombe Wood.

Elachista gangabella, Zeller. The type form of this species has a white fascia on the anterior wings, as in E. zonariella and others of the group. The specimen exhibited, however, is entirely black. In certain lights there are very faint indications of the fascia. Bred by me last year from larvæ received from Mr. Stainton. It seems to be quite a south country species, and very local.

Mr. W. W. Saunders exhibited a small folding box, manufactured by Mr. Harris, of Oak Lane, City, for the purpose of transmitting small articles by post; from its lightness and strength he considered it would prove useful for entomological purposes.

Mr. Saunders also exhibited some small galls growing in close clusters, found under the ground on the roots of common hazel. He had not yet succeeded in rearing the insect which caused them, but considered it must prove a distinct species from the Cynips Quercus-radicis, the galls produced by which are found on the oak, generally on the surface or immediately above ground.

Mr. Saunders also exhibited an apparently new species of Harpalus, taken in Ireland by Mr. Bouchard; and illustrations of the economy of a beetle, apparently of the genus Urodon, from the Cape of Good Hope, which, in the larva state, inhabits one

of the cells in the seed-vessel of a Mesembryanthemum, forcing the remaining cells, which become abortive, into a very small space.

Mr. Walker observed that the galls exhibited by Mr. Saunders were probably similar to one which Mr. Bouchard had lately found at the root of an oak tree. This gall was in the possession of Mr. Smith, who has reared numerous Cynipidæ from it, and also specimens of a Pteromalus, which much resembles P. Puparum, the butterfly-chrysalis parasite.

Mr. H. Cooke exhibited a hybrid moth which had been obtained in the following manner. He had bred a considerable number of Ephyra trilinearia and E. orbicularia, and had repeatedly endeavoured to pair the opposite sexes of these species, but only succeeded in one instance in doing so, the insects being a male E. orbicularia and female E. trilinearia. The female deposited eight eggs, all of which hatched, and the larvæ in due course were full-grown, at which time they presented great dissimilarity in appearance, two or three exactly resembling the larvæ of E. trilinearia, while others were precisely like those of E. orbicularia, the remainder differing much from those of either parent. Although all of them seemed to enter the pupa state in the most satisfactory manner, yet only the one moth exhibited, and that somewhat crippled in the posterior wings, was produced. This insect bore very little resemblance to either species, the colour and markings approaching nearer to E. poraria, the central fascia common to all the wings being broad and well defined.

Mr. Bond exhibited a specimen of Smerinthus ocellatus, having one side of the abdomen pure white, the markings in all other respects being as usual. The insect was taken at Freshwater.

Mr. Rye exhibited a specimen of Euryporus picipes, taken at Holme Bush. Also both sexes of Ptinus germanus, from Purfleet; and a fine series of Badister peltatus, taken by himself near Boston.

Mr. Saunders read the following extracts from Froebel's 'Central America,' pp. 433 and 537:—

Poisonous Caterpillars.

"Early the next morning we arrived at San Antonio. Here I learned what had befallen, during the three months of my absence, the small caravan with which I had started from Chihaohoa. They had encamped in the prairie, a few miles from San Antonio. Sickness had broken out among the mules, carrying off nineteen of the best animals, and afterwards more died on the road. Several had been bitten by rattle-snakes, and saved with the greatest difficulty. The same thing happened to one of our drivers, but a remarkable accident befel the waggon-master; he had crushed on his hand a little hairy caterpillar which was crawling on it, and in a few minutes the most alarming symptoms appeared. A shiver ran from the hand through his whole frame, and especially down his back. His abdomen swelled, his tongue was heavy, his consciousness became dimmed, and for a week the man was in imminent danger. I afterwards saw the caterpillar in a collection of insects at San Antonio, where the patient recognised it. If he was right it is a little worm covered with long yellowish hairs, about a quarter of an inch long; it resembles a caterpillar, but whether it is one I cannot say. I afterwards heard of other examples of the extraordinary effects caused by this creature. In a garden at Indianola one of them dropped from a tree on to a child's arm, who immediately screamed with pain; the arm swelled, a violent fever came on, and the child's life was in great danger for several days."—p. 433.

Mineralogical Ants.

"Before continuing the account of our journey I must offer a remark connected with an observation I made in the desert. When traversing certain parts of the North-American Steppes and Deserts I have frequently observed ant-hills formed exclusively of small stones of the same mineral species, as, for instance, small grains of quartz. In one part of the Colorado Desert the hills of these mineralogical ants consisted of heaps of small shining fragments of crystallized feldspar, chosen by these little animals from the various components of the coarse sand of these parts. The last time I was at El Paro a North-American driver came to me and inquired the value of a small bag of garnets he possessed. On my asking in what place they had been found I heard that these stones — imperfect crystals of red transparent garnets — were the material of which the ants build their hills in the country of the Navago Indians, in New Mexico, and that he knew a place where any quantity of them might be collected. These remarks may perhaps not be uninteresting to the question relating to the gold-seeking ants of Herodotus."— p. 537.

Mr. Saunders also read descriptions of some new species of the genus Eratcina; and exhibited the insects to the meeting.

Part 5 of the current volume of the Society's 'Transactions' was on the table.

June 4, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'On the Cultivation of Silk at Mussooree, Himalaya Mountains, with Notes on the Treatment of the Silkworm;' presented by the Author, Capt. Thomas Hutton, F.G.S., Superintendent of Government Silk Plantations. 'On some New Longicornia from the Moluccas;' 'On some New Anthribidæ;' by the Author, F. P. Pascoe, Esq. F.L.S., &c. 'The Journal of Entomology,' No. 1; by the Proprietors. 'The Zoologist' for June; by the Editor. 'Proceedings of the Royal Society,' No. 38; by the Society. 'Tijdschrift voor Entomologie,' Vol. ii. Part 6, Vol. iii. Parts 1, 2 and 3; by the Entomological Society of the Netherlands. 'A Catalogue of the Lepidopterous Insects in the Museum of Natural History at the East-India House,' by Thomas Horsfield, M.D., Ph.D., F.R.S., Keeper of the Museum, and Frederick Moore, Esq., Assistant, Vol. ii.; by the East India Company. 'The Athenæum' for May; by the Editor. 'The Journal of the Society of Arts;' by the Editor. 'The Entomologist's Weekly Intelligencer,' Nos. 188—191; by the Editor.

Exhibitions.

Mr. Stevens exhibited a specimen of Criomorphus castaneus, found alive in the playground of a school at Blackheath. He observed that the species had been recorded

as British, by the name of Callidium luridum, but he believed its claims to be considered a native were rather doubtful.

Mr. W. W. Saunders exhibited two specimens of Papilio Antenor, *Drury*, sent from Madagascar by Mr. Layard, and read the following note of their capture by that gentleman. "I have sent two not very good specimens of Papilio Antenor of Drury, which I shot at Boyana Bay, Madagascar. They fly very high, and I could not obtain them in any other way. I have two more from the French missionaries, who said they did sometimes come down."

Mr. Bond exhibited two living examples of Acrocinus longimanus, and two specimens of Deilephila lineata, caught near Brighton on the 12th and 14th ult. He also exhibited two dead pupæ of Sphinx Convolvuli, found last autumn in a potato-field near Canterbury; and an enormous cocoon of Eriogaster lanestris, three larvæ having united in forming it.

Mr. Stainton exhibited specimens of Deilephila lineata from Lewisham and Torquay.

Mr. M'Lachlan exhibited specimens of a species of Cecidomyia, which he had bred from small galls found on buds of the common broom.

Mr. Janson exhibited Sphærites glabratus, Rhinomacer attelaboides and other Coleoptera from Scotland.

Mr. Stainton exhibited Lithocolletis Helianthemi, bred from larvæ mining in leaves of Helianthemum vulgare, received from Ratisbon; and a specimen of Aspidisca splenderiferella, an American species of Tineina, bred from Cratægus tomentosa.

Mr. Moore exhibited a living example of the Eria silk moth (*Attacus Ricini*) bred from a larva which fed on the castor-oil plant.

Mr. Gorham exhibited the following Coleoptera:—

Dinarda dentata. Taken by Mr. Crotch in nests of Formica fusca.
Haploglossa rufipennis. Taken in sandpits near Addington.
Mycetoporus lucidus. Wimbledon Common.
Eucephalus complicans. Charlton.
Lathrobium punctatum. Hammersmith.
Læmophlæus duplicatus. Near Farnborough, Kent.
Chryphagus micrographus. Isle of Wight. Of this species Mr. Lewis had taken a single example near Croydon.

Mr. Tegetmeier exhibited some remarkable specimens, illustrating the production of fertile workers in a hive of the ordinary honey-bee (*Apis mellifica*). They were produced by placing, in March, a comb containing eggs and larvæ *in workers' cells only* in a hive which had been some time without a queen, and which consequently contained no brood whatever. There was no apparent attempt made by the bees to form a royal cell and to rear a new queen from the workers' eggs, but after the latter were hatched the bees produced from them laid eggs. These were deposited in the drone cells only, sometimes as many as six being placed in one cell, of which only one was hatched, a drone in all cases being produced. It was noticed that these fertile workers were hatched and laid eggs before any drones had been observed in the adjacent hives. Huber supposed that such workers were produced by partaking of some of the food designed for the production of a queen, which had been deposited in the cells adjacent to the royal one. This supposition was disproved, as there was no royal cell in the single brood-comb which the hive contained.

Mr. S. Stevens communicated the following extract from a letter from Robert Clark, Esq., and exhibited a specimen of the fly alluded to therein :—

"These insects are pretty numerous in the windward division of the Gold Coast, in March, April, May, November and December, especially in the three former months, before the first rains set in, when the weather is generally close and oppressively hot. As soon as they are observed, either in or about the houses of the Europeans or natives, everything is done to get rid of them, for when they alight on the person they inflict a painfully stinging wound, rapidly followed by a wheal, which becomes the seat of an annoying itchiness. The proboscis, as you may have noticed, is strong and keen, and they readily push it through thick clothing and thin leather. Horses and other beasts of burden suffer severely from their attacks, and there are good grounds for believing that this is the cause why no animal of that description will live upon the windward part of the Gold Coast; indeed, my friend Mr. R. D. Ross was so persuaded of this being the case that he made a strong representation to the head of the Commissariat Department to that effect, suggesting, at the same time, that hammock instead of horse allowance should be granted to the officers of the G. C. A. Corps stationed in the windward districts.

"In 1858 I procured from the late Mr. Consul Campbell, of Lagos, four horses for the use of some of the officers stationed at Cape Coast Castle. They arrived in fair condition, were well stabled, carefully groomed and fed, nevertheless in six or eight weeks from the date of their landing they were all dead. This did not seem to me to arise from the grass, as it was in every respect quite equal to that on which horses feed and thrive admirably on the leeward division of the Gold Coast, at Sierra Leone and the Gambia. The precaution of partly drying it before it was given to the animals was not neglected, and their food was varied with ground nut-straw, which is considered capital fodder for horses both at Sierra Leone and the Gambia. The late Mr. Brodie Cruikshank even imported hay and oats from England, conceiving (I am of opinion incorrectly) that the mortality of beasts of burden depended upon some poisonous herb being mixed up with the grass on the part of the Gold Coast I refer to, but as might be anticipated the experiment in question proved a complete failure.

"With regard to these insects I think I told you that a Mr. Glydden, purser of H.M. store ship 'Buffulo,' to whom I showed them on the Coast, insisted that they are identical with the tzetze described by Dr. Livingstone, alleging that he had met with them in some of the regions of Southern Africa which he had visited."

Mr. Westwood remarked that the insect exhibited was closely allied to the common Tabanus bovinus of Europe, and certainly not the "tzetze" met with by Dr. Livingstone and others, as was asserted in the latter part of the letter just read.

Dr. Wallace communicated the following :—

Remarks on the Occurrence of Rarer British Sphingidæ.

"The fact that in many female Sphingidæ captured in Great Britain and Ireland, in the autumn months, no ova have been found, induces the question as to whether some species may or may not be continuously indigenous. Many think that the absence of ova in the female is merely a question of time, as in the case of A. Atropos, the females of which, notoriously devoid of eggs in the forced autumn specimens, are found in June depositing ova, whence the brood is perpetuated. Others maintain that it is

a question not of time only, but also of place, for taking S. Convolvuli, females of which are constantly taken in the autumn months, almost invariably without eggs (in 1846 and 1859 the species occurred most freely: one individual took nearly fifty specimens in 1859, all the females of which were destitute of ova). In this case either a female is hatched in the autumn with eggs, hybernates and deposits ova in the spring, or emerges in the spring from the pupa, or else specimens fly over from abroad and deposit ova in this country. I would ask has ever S. Convolvuli been taken or observed in the spring or early summer in this country, and if so in what condition or of what sex? Are we to look for a development of females of D. Lineata without eggs, in the autumn months, if a hot summer intervenes? A series of observations carefully made as to time, place, condition, sex, and also as to the complete development of sexual organs of any or all of the rarer Sphingidæ, would help to resolve the question. Without giving any opinion myself, I may add the truth can only thus be obtained, from a series of observations, not from a single capture. Have any of the commoner Sphingidæ, the Smerinthi or others, occurred in the autumn months, and if so were they fully developed? Are any of the rarer Noctuæ to be looked upon in the same light?

"This question appears of more importance than the double-broodedness of some Notodontidæ, about which so much has been written, and I commend it to the attention of entomologists."

Mr. Smith read an extract from Park's 'History of Hampstead,' in which it was stated that in 1782 great numbers of "vermin" appeared on the hedges and trees in that neighbourhood, and that men were employed to beat them off with poles and burn them. These persons experienced considerable irritation on the face and other exposed parts of the person, whilst those who incautiously inhaled the fumes produced by burning them were much indisposed in consequence.

Mr. Stainton considered these "vermin" were the larvæ of the brown-tail moth (*Porthesia Chrysorrhœa*), which had in former years appeared in immense numbers in this country, and the hairs of which and many of its congeners were well known to produce much irritation of the human skin.

Mr. Smith also read the following papers:—"Observations on Cynips lignicola and C. Radicis," and "Descriptions of new Species of Australian Hymenoptera and of a Species of Formica from New Zealand."

Mr. Baly read a paper intituled "Description of some New Species of Sagra; Remarks on that Genus; and the Characters of Cheiloxena, a New Genus belonging to the same Family."

July 2, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Journal of the Proceedings of the Linnean Society,' vol. v. No. 17; presented by the Society. 'The Zoologist' for July; by the Editor. 'The Athenæum' for May; by the Editor.

Election of a Subscriber.

C. Miller, Esq., 17, Silurian Terrace, Dalston, was balloted for, and elected a Subscriber to the Society.

Exhibitions.

Mr. Stevens exhibited a portion of a collection of drawings of European Lepidoptera, in which the wings were formed by transferring the scales from the wings of the insects by a process not ascertained, the bodies and limbs being afterwards beautifully drawn in water-colours. Mr. Stevens stated that the entire collection was contained in seven portfolios, and comprised nearly the whole of the European Macro-Lepidoptera; it had been formed in Germany, by the labour of a lifetime, and now sent to England to be disposed of at a very moderate price.

The specimens exhibited were much admired by the Members present, some of whom stated they had tried various modes of transferring the scales of Lepidoptera to paper, but with very unsatisfactory results.

Mr. Janson exhibited the following Coleoptera, taken at Rannoch by Mr. C. Turner, viz., Otiorhynchus septentrionis, *Herbst*, Scolytus Ratzeburgii, *Janson*, Magdalinus carbonarius, *Fab.*, and Rhagonycha paludosa, *Fallen*.

Mr. Janson also exhibited a specimen of Homalota subterranea, *Mulsant.*, a species first detected in France, which he had found at Mickleham, Surrey, on the 23rd ult., under a stone, in a nest of Formica flava. He also exhibited Ischnoglossa rufopicea and Conosoma bimaculatum, found beneath bark of oaks at Colney Hatch.

Mr. McLachlan exhibited a fine specimen of Chrosis Audouiana, lately caught at Darenth Wood, Kent.

Mr. Douglas exhibited the following Coleoptera, found in the sap exuding from the perforations formed in oaks by the larva of Cossus ligniperda, viz., Cryptarcha imperialis, Epuræa 10-guttata, Tachinus bipustulatus, Homalota cinnamomea, H. hospita, and Omalium planum. He also exhibited Conopalpus testaceus, bred from rotten oak-branches from Richmond Park.

The Rev. H. Clark sent for distribution amongst the Members specimens of Laccophilus variegatus, *Germ.*, taken by him at Pevensey in June last.

Mr. Lewis exhibited specimens of Thiasophila inquilina, found at Charlton in nests of Formica fuliginosa. Mr. Lewis remarked that he had, at the Meeting of the Society held on the 2nd of April last, exhibited a specimen of Telephorus atra, *L.*, and stated it to be a species unrecorded as British; but he had since found that it had been long before included by Mr. Murray in his 'Catalogue of Scottish Coleoptera.'

The Secretary read a letter from R. J. L. Guppy, Esq., Port of Spain, Trinidad, on the habits of an insect allied to, if not identical with, Ranatra linearis of Europe, which he had found in streams in that island.

August 6, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Catalogues of Natural History Collections in the British Museum,' *viz.* Lepidoptera, Part 1 (Papilio); Hymenoptera, Parts 1 and 2 (Chalcidites); Hymenoptera, Parts 1—7; Diptera, Parts 1—7; Homoptera, Parts 1—4, and Supplement; Hemiptera, Parts 1 and 2; Orthoptera, Part 1; Nomenclature of Coleoptera, Parts 3, 4 and 6; Coleoptera, Parts 7—9; Coleoptera of Madeira; Coleoptera, Part 1 (Cucujidæ); Hispidæ; Neuroptera, Parts 1—4; Neuroptera, Part 1 (Termitina); British Animals, Parts 5—17; British Hymenoptera, Part 1; British Fossorial Hymenoptera; British Ichneumonidæ; British Curculionidæ; British Diatomaceæ; Marine Polyzoa, Parts 1 and 2; Lepidoptera Heterocera, Part 20. 'Proceedings of the Royal Society,' vol. x. No. 39; presented by the Society. 'Journal of the Proceedings of the Linnean Society,' Supplement to vol. iv. (Zoology); by the Society. 'Proceedings of the Royal Physical Society of Edinburgh,' vol. i.; by the Society. 'Catalogue of British Coleoptera,' Sheets K and L; by the Author, G. R. Waterhouse, Esq. 'Exotic Buterflies,' Part 35; by W. W. Saunders, Esq. 'The Zoologist' for August; by the Editor. 'The Athenæum' for July; by the Editor. 'The Journal of the Society of Arts' for July; by the Society. 'The Natural History of the Tineina,' vol. v.; 'The Entomologist's Weekly Intelligencer,' Nos. 192—200; by H. T. Stainton, Esq. 'Linnæa Entomologica,' vol. xiv.; by the Entomological Society of Stettin.

Exhibitions.

The President exhibited specimens of Stathmopoda pedella, one of the Tineina hitherto so extremely rare in our collections that only two or three examples were known. He found it in abundance in July in the foliage of alder trees at Lewisham, and other persons had also taken it there, so that more than 200 specimens had been captured. Professor Bohemann had recently informed him that this moth was not scarce in Sweden, but he was not aware that the larva had been observed since Linneus wrote of it, "Habitat in Alni foliis subcutanea." It was to be hoped that with this guide to its habits no long time would now elapse before the larva would be re-discovered. The President called attention to the peculiar position in which the spinose hind legs were held in repose—turned under the wings and extended laterally in front of them—a peculiarity which had been noticed by Linneus. Even when the moth walked, these legs were rarely put down, so that the creature usually walked about by means of its other four legs only.

The President also exhibited a specimen of Phloiotrya rufipes, found dead under the bark of an old oak at Leatherhead Common.

Mr. Bond exhibited specimens of a Trochilium, recently taken by Mr. G. King at Torquay; and also some examples of apparently the same species from the collection of J. R. Hind, Esq., captured in Spain, and labelled Philanthiforme.

The species taken by Mr. King, as far as can be ascertained from the damaged

condition of his specimens, appears to be the S. Muscæformis of Esper, originally recorded as a British species by Mr. Newman, in his "Monographia Ægeriarum Angliæ" (Ent. Mag. vol. i. p. 79), on the authority of a specimen in the collection of Mr. J. F. Stephens; the species was also given as British by Mr. Stephens in the Appendix to his 'Illustrations' (Haust. iv. p. 385), on the authority of the same specimen, which, however, he subsequently considered to be merely a variety of S. Ichneumoniformis, and placed it as such in his 'Catalogue of British Lepidoptera in the Collection of the British Museum' (Part 5, p. 31). This specimen (now contained in the collection of the British Museum) is unquestionably a damaged example of S. Ichneumoniformis.

Mr. Janson exhibited three unrecorded species of British Coleoptera, recently taken by Charles Turner at Rannoch, Perthshire, and made the following observations respecting them:—

Rhopalodontus perforatus, Gyll. *Cis perforatus*, Gyll. Ins Suec. iii. 385, 7 (1813). *Rhopalodontus perforatus*, Mellié, Annales de la Soc. Ent. de France, Ser. 2, vi. 234, tab. 9, fig. 23 (1848).—The first indigenous example of this pretty little insect which came under my notice I obtained from the late James Foxcroft, mixed up with some scores of Cis nitidus, reared during the winter of 1853-4, from a hard woody boletus he found on the trunks of old birch trees in the Black Forest, Perthshire, and which, remarking that it was perforated by innumerable minute coleopterous larvæ, he brought up with him to London the previous autumn. Turner, who carefully examined the specimen, and to whom I pointed out its most obvious distinctive characters and communicated its history, has succeeded in securing upwards of thirty examples.

Rhagonycha elongata, Fallen. *Cantharis elongata*, Fallen, Mon. Canth. i. ii. 8 (1807); Gyll. Ins. Suec. i. 335, 8 (1808). Nearly allied to Rhagonycha paludosa, *Fallen*, *Gyll.*, exhibited by me at our last meeting, but readily distinguished from it by its superior size, relatively narrower form the pale basal joints of its antennæ, pale apex of its femora and base of its tibiæ, and its subquadrate prothorax, of which the posterior angles are salient. Gyllenhal and Sahlberg inform us that this species "habitat in frondibus abietis." Zetterstedt remarks that it occurs likewise on birch "in Betuletis Nordlandiæ et Finmarkiæ;" from Turner, who is far from communicative touching his craft, all the information I can elicit is that he "got it in a very strange way."

Brachonyx indigena, Herbst. *Curculio indigena*, Herbst, Natur. Syst. Col. vi. 170, 130, tab. 71, fig. 12 (1793 ?). *Rhynchaenus indigena*, Gyll. Ins. Suec. iii. 71, 7 (1813). *Brachonyx indigena*, Schoenh. Curc. Disp. Meth. 232, 132 (1826); Gen. et Spec. Curc. iii. i. 329, 214 (1836); Guérin, Icon. Ins. 145, tab. 38, fig. 3 (1833 ?).—This species is found, according to Gyllenhal and other continental authorities, "in Pini Sylvestris frondibus." Turner, to whom I sent instructions to search for it on this tree, asserts he beat it from birch. Although of not unfrequent occurrence in Sweden, Finland, Lapland, and in the mountainous districts of central Europe, it would appear to be exceedingly rare in Scotland, as Turner assures me that every effort on his part had yielded three examples only, one of which is unfortunately mutilated.

Mr. Waring exhibited two fine specimens of Acidalia rubricata, and a beautiful female of Lithostege nivearia, taken near Brandon, Suffolk, during the present season.

Mr. Scott exhibited the following Lepidoptera:—

Coleophora binotapennella. Bred from larvæ found two years ago at Brighton.

Tinea caprimulgella. Found on the trunk of a tree in Blackheath Park.

Ephestia semirufa, Haw. Found abundantly near Lewisham, as also the variety rufa described by Haworth as a species. Mr. Doubleday informed Mr. Douglas that he had seen no specimens of this insect since he received it from Mr. Dale many years ago.

Mr. Scott also exhibited the following Coleoptera:—

Deleaster Dichrous, Grav. Taken at Crwmlyn, Monmouthshire. June.
Stilicus fragilis, Grav. Taken at Crwmlyn, Monmouthshire. June.
Clythra 3-*dentata* Found at Darenth Wood.

Mr. Mitford exhibited a beautiful series, including both sexes, of Nemotois cupriacella, lately caught at Hampstead: though the female of this species has been frequently taken in various parts of England, the male had not previously been captured.

Mr. Miller exhibited a number of interesting Micro-Lepidoptera, including an apparently new species of Coleophora bred from larvæ which fed on hazel, and a Lithocolletis, the larva of which mined in leaves of the plum tree.

Mr. F. Walker exhibited a remarkable variety of Lasiommata Megæra, and made the following observations respecting it:—

This singular variety of L. Megæra, if it had been found in a distant region, would perhaps have been considered to be a distinct species. It was taken by my son in Guernsey. The upper surface somewhat resembles that of L. Clymenus, a Russian species, and in the band of the fore wings of the male not being forked it approaches L. Tegelius from Corsica. The most decided peculiarity is in the under side of the hind wings, and it appears to differ as much from L. Megæra as the latter does from L. Mæra and L. Mæroides, *Boisd.*, found in Hindostan; this last species hardly differs from L. Mæra. Examples in the British Museum of L. Megæra from Persia in no wise differ from the European specimens.

Mr. Waterhouse exhibited specimens of the Cychramus fungicola of Heer and Erichson, an insect which he believed had been commonly confounded in this country with the C. luteus. The C. fungicola, however, might be distinguished by its more convex form, stronger punctuation, less dense and coarser pubescence, and, usually by the disc of the elytron being clouded with brown.

A series of C. luteus was exhibited, with the C. fungicola for comparison. Mr. Waterhouse stated that he believed both speeies were equally common, and that he had taken them both at Darenth Wood, Birch Wood and Erith. He here observed that the second species of Byturus (*viz.*, B. fumatus) he had this year found both at Darenth and Birch Woods; that at the time he first called attention to the existence of B. fumatus in England, he was not aware of the localities of the very few specimens which came under his notice. The B. fumatus he was aware had been taken by other entomologists in the London district; he had seen specimens captured by Mr. Douglas and Mr. Stokes.

Mr. Waterhouse then exhibited specimens of two species of Centorhynchus, which had to be added to our list of British Coleoptera. The first was the C. Syrites of Germar, Gyllenhal and Schönherr. The specimens exhibited were found by sweeping in the field opposite the inn at Birch Wood Corner, on the 11th of July last, and he had taken a single specimen at Erith on the 26th of June last.

The C. Syrites is nearly allied to C. assimilis, but may be distinguished by its shorter and more convex form, the larger size of the white scales (which are very dense, and form a white line along the suture), with which it is clothed, the somewhat coarser

sculpturing, and, lastly, by the apical third of the elytra being covered with minute tubercles, both on the upper surface and sides. Formerly another species of Ceutorhyncus had been mistaken for the C. Syrites, *viz.*, the C. inaffectatus of Schönherr, a more oblong and more depressed insect, readily distinguished by its femora being dentate, on which account it is placed in a separate section.

The other species exhibited was the C. tarsalis, of which Mr. Waterhouse had taken specimens at Erith, on June 26th, by sweeping. It was found in company with C. sulcicollis, which it much resembles. Like that insect it has a patch of pale (either yellowish or almost white) scales on the sides of the chest, at the angle between the thorax and elytra, but its form is more elongate and depressed, and, instead of being dull black above, it is somewhat glossy, especially the elytra, which, moreover, have a slight metallic tint, usually of a bronze hue. In its form it more nearly approaches the C. cyaneipennis, from which it may be distinguished by its dark colouring, and the pale patch of scales already alluded to, and from both the species named it differs in having pale testaceous tarsi.

Mr. Waterhouse then proceeded to observe that "Mr. Walton, having prepared a Catalogue of the British Curculionidæ for the British Museum, and all the desiderata of the Museum British collection being marked in this Catalogue, he, with his well-known liberality and public spirit, then presented to the public a series of all the species which were desiderata to the Museum, including the unique specimens. Among these specimens thus presented are two British specimens of a Ceutorhynchus bearing the name "tarsalis;" there is, also presented by the same gentleman, a third insect with the same name, this last having been received by Mr. Walton from Germar. With Germar's specimen the insect exhibited by me as C. tarsalis agrees perfectly, as it does likewise with Schönherr's description, but when compared with Mr. Walton's two specimens I notice differences which lead me to doubt if they be the same species; they want the metallic gloss on the elytra, are rather more convex, the striæ of the elytra are rather more strongly marked, and the interstices are more strongly rugulose; moreover, the tubercles at the apex of the elytra are much less distinct. I cannot help thinking that the two insects in question will prove to be varieties of the C. sulcicollis, in which the tarsi are piceo-rufous instead of black. It seems to me probable that Mr. Walton had some doubts of this identification, and hence did not introduce the species C. tarsalis into his list. An insect which appeared to me to agree with Mr. Walton's I now exhibit: it certainly is a very rare circumstance for C. sulcicollis to have the tarsi ferruginous; for I have examined an immense number of specimens, and this is the only one I have seen, with the exception of the two specimens in the Museum already alluded to."

Mr. Waterhouse also exhibited a specimen of Trox hispidus of Laichart, and likewise a specimen of Crioceris dodecastigma of Panzer, both of which he had reason to believe were English; he knew not the locality of either, and his object was to call attention to these insects, through which he thought it possible to learn some definite localities for them.

Of these insects he has possessed a specimen of each for years; they were given to him by his friends, and were supposed both by him and them to be the nearly allied British species, *viz.*, Trox sabulosus and Crioceris 12-punctata. The Trox Mr. W. had long back separated from sabulosus, but could not identify with any description, but recently Dr. Power brought to him for identification a species which appeared to him distinct from others. With this Mr. W. was able to satisfy himself that Dr.

Power's insect is the Trox hispidus of Laichart, and that his own insect is a variety of the same, in which the thorax is very sparingly punctured, whereas it should be rather thickly punctured. The species is readily distinguished by the alternate rows of smaller and larger tubercles on the elytra.

The Crioceris dodecastigma, which has until quite recently been confounded in his collection (never having been looked at probably since it was received), is distinguished from C. 12-punctata by the legs and under parts of the body being entirely black, instead of red. The orbit of the eye is also entirely black, and the antennæ are less stout, &c.

Mr. Rye exhibited a specimen of Deleaster dichrous, taken in a house at Glasgow; a female of Odontæus mobilicornis, from Darenth Wood; and a singular male example of Rhynchites betuleti, destitute of the usual spines on the thorax.

Mr. Westwood exhibited some examples of the pupæ of Papilio Machaon, received from Dr. Verloren, and detailed some experiments by him, proving that the well-known diversity of colour in the pupæ of this species is not indicative of the sexes, or of any variation in the colours of the imago.

Natural Cross Breeding in Bees.

Mr. Tegetmeier described a series of experiments he had been making recently to ascertain whether there existed any natural means for preventing continued interbreeding in the honey bee. He stated that his own experience, as a breeder of several varieties of vertebrate animals, was that continued interbreeding led to deterioration of size, great delicacy of constitution, and ultimately to extinction of the race. It had been alleged, in opposition to these views, that continuous interbreeding was not injurious to the bee, the young queens being supposed to be fertilized by the drones of the same hive, bred from the same parent. It is well known that on a stranger worker bee attempting to enter a hive it is at once seized by the guards, and, unless it succeeds in escaping, stung to death. He found that on placing drones captured as they entered one hive at the entrance of another they ran in and were readily received. In order to ascertain whether they ever willingly entered other hives than those from which they emerged, he marked them as they flew forth, by dusting them with flour, and observed that about one-third of the whole number flew into other hives on their return. The workers do not appear to distinguish between stranger drones and those of their own hive; in fact the drones seem common to all the hives in an apiary; hence, even supposing a young queen to be always fertilized by the drones inhabiting the hive in which she is reared, continuous interbreeding must of necessity be prevented.

Mr. Tegetmeier also exhibited reared specimens of Apis Ligustica, from a hive of that species at the Apiary, Muswell Hill, London.

Mr. Westwood read "Remarks on the Effects of Time and Heat in the Development of certain Sphingidæ," being the results of most elaborate observations, by Dr. Verloren, on Sphinx Ligustri and other species.

Mr. Scott read descriptions of four new species of Coleophora, *viz.*, C. Melilotella, C. Artemisiella, C. Ardæpennella and C. politella.

Part 6 of the current volume of the Society's 'Transactions' were announced as published.

September 3, 1860.

H. T. Stainton, Esq., V.P., in the chair.

The following donations were announced, and thanks ordered to be presented to the donors: — 'Monographie des Elaterides,' par M. E. Candèze, Tome troisième; presented by the Author. 'Verhandlungen der Kaiserlich-Königlichen Zoologisch-Botanischen Gesellschaft in Wien,' Vol. ix.; by the Society. 'The Proceedings of the Zoological Society of London,' 1860, Parts I. and II.; by the Society. 'Stettiner Entomologische Zeitung,' 1860, Nos. 4—9; by the Entomological Society of Stettin. 'Coléoptères des Iles Açores,' par Frederic Tarnier; by the Author. 'The Zoologist' for September; by the Editor. 'Proceedings of the Literary and Philosophical Society of Liverpool during the Forty-ninth Session, 1859—60;' by the Society. 'The Journal of the Society of Arts' for August; by the Society. 'The Entomologist's Weekly Intelligencer,' Nos. 201—204; by H. T. Stainton, Esq.

Election of a Subscriber.

John Ellerton, Esq., of 9, Westmoreland Place, Westbourne Grove, was elected a Subscriber to the Society.

Exhibitions.

Mr. Stevens exhibited two examples of Diachromus germanus, recently captured in the town of Deal; one having been found by Mr. Smith, jun., crawling on the pavement; the other by himself, on the wall of a house.

Mr. Waterhouse exhibited examples of the larva, pupa and imago of Trachodes hispidus, forwarded to him by Mr. Plant, of Leicester.

Mr. Waterhouse also exhibited two species of Dorcatoma, both bred from rotten wood brought from Richmond Park. The first was D. flavicornis, and was merely exhibited for comparison with the second, which Mr. W. believed to be the D. chrysomelina of Sturm. It differs in being more oblong than D. flavicornis. The three terminal joints of the antennæ are much more dilated in the male, and the penultimate and antepenultimate joints have the upper edge emarginate. In specimens which appear to be females the corresponding joints differ much less from those of D. flavicornis; still the upper edge is slightly emarginate, and the three club joints are more unequal in size, the first being relatively larger.

Mr. Janson remarked that Mr. Frederick Smith had captured, some twelve years back, on old oaks near Peckham, a species of Dorcatoma which agreed well with Sturm's figure and description of D. chrysomelina; he had himself likewise taken the insect in the same locality, and had labelled it in his collection without doubt as D. chrysomelina, *Sturm*.

Mr. Pelerin exhibited a beautiful variety of Staphylinus cæsareus, having the pubescence entirely fulvous. Also, Platystethus nitens and Mycetophagus 4-guttatus, taken at Hornsey, both these species being of very rare occurrence in Britain.

Mr. G. King exhibited some fine varieties of Crambus paludellus, Argynnis Euphrosyne, Arctia villica and Calligenia miniata. Also, a series of Acentropus niveus, from Horning Fen, Norfolk.

Mr. Lewis exhibited specimens of Hallomenus humeralis, which he had lately found in abundance on a fence at Charlton. This species was first recorded as British in the 'Entomologist's Annual' for 1859.

Mr. Stainton exhibited some larvæ of Nemotois scabiosellus which he had received from Herr Hofmann, of Ratisbon. They had been obtained by collecting the scabious-heads in which females had been observed ovipositing. The difficulty attendant on the finding of these larvæ was now apparent, as the young larva fed *in* the seeds, and then made use of the seed-husk as a case, till it had attained a sufficient size to require a flat leaf-made case. Whilst ensconced in the seed-husk the larva could scarcely be detected, the inhabited seed-husk resembling so precisely the other seeds of the plant.

Mr. Janson exhibited specimens of a new British Donacia, D. Comari (*Ahr.*), *Suffrian*, taken by the late James Foxcroft in Perthshire, in May, 1854. He remarked that this species so nearly resembled the common D. sericea, *L.* (D. Proteus, *Steph.*), that it has probably been confounded with it in some of our collections; it may, however, be readily distinguished by its parallel elytra, and the totally different structure of its antennæ, which are much shorter and stouter, with the third joint only just perceptibly longer than the second, and but very little shorter than the fourth; whereas in D. sericea the antennæ have the third joint fully half as long again as the second, and nearly as much shorter than the fourth. He observed that the occurrence of this species in Britain was particularly interesting, as it had hitherto been found only in the Hartz mountains, where it was discovered about the year 1806, by Dahl, who, from mercenary motives, not only kept its true locality a secret, but circulated various absurd and false statements respecting it; thus, Ahrens, in his 'Monograph of Donacia' (Neue Schriften der Naturforschenden Gesellschaft zu Halle, 29, 1810), relates that Dahl had beaten it in some numbers from pine trees. Twenty years subsequently, however (in the summer of 1830), Ahrens found the beetle in considerable plenty in the Hartz, on the leaves of Comarum palustre; and at the end of July in the following year Dr. Suffrian met with it under similar circumstances in the same locality (*vide* Ent. Zeit. Stett. vii. 85, 1846). Mr. Janson further remarked, that although our British species of Donacia are readily separable by external characters, several North-American species are not only so closely allied *inter se*, but, moreover, bear so strong a resemblance to certain European species, that while, on the one hand, certain slight yet apparently constant peculiarities in habit induce the conviction that they are really specifically distinct, it is, on the other hand, utterly impossible to find good diagnostics whereby to characterise them. A few evenings since, being engaged with Mr. Baly in endeavouring to throw the North-American Donaciæ of that gentleman's extensive collection into species, they remarked that many of the specimens presented an exserted organ at the apex of the abdomen; these they at first supposed to be males, but the microscope soon convinced them that they were females, and that the organ thus protruded was the ovipositor within its sheaths. To clear up the doubts they at first had on this point they examined many specimens, and the result not only satisfied them that this organ is the ovipositor, but that the structure both of the superior and inferior valves, especially the first, varies so much in apparently closely-allied species as to afford reliable characters for their discrimination.

Mr. Rye exhibited a Bagöus, apparently distinct from the recorded British species, taken at Hammersmith. Also, on behalf of Mr. Solomon, the following rare Coleoptera: — Aleochara ruficornis, from Campsie Glen, Glasgow; Philonthus lepidus, from Southport; Omias sulcifrons, from York; and Phlëophagus Spadix, from Purfleet.

Mr. McLachlan exhibited some Lepidoptera recently captured in the Isle of Wight, including fine specimens of Triphæna subsequa and Depressaria bipunctosa,

and a long series of a Gelechia allied to G. instabilella and G. ocellatella, but considered by him perfectly distinct from either.

Mr. McLachlan also brought for distribution among the members a series of bred specimens of Coleophora saturatella.

Mr. Janson read the following letter, lately received by him from Walter Elliott, Esq., of Hawick, N.B., dated August 30, 1860 :—

" Dear Sir,—I have not been unmindful of the interesting conversation I had with you in the month of June last, on the subject of the Hylobius Abietis, but several things have occurred to call me away from home, and I have not been able to make much investigation, until within the last few days, into the ravages of the insect.

" I find that although well known to the working foresters with whom I have conversed, the insect has attracted little attention from proprietors of woodlands and country gentlemen.

" The larch is known to be failing throughout Scotland, and I believe throughout Britain; and much speculation exists as to the cause or causes. The Scottish Arboricultural Society, instituted in 1854, offered a prize in 1857 for the best essay on the causes of decay in the larch (' On the Dry Rot and other diseases in Larch and Spruce'), and in the volume of their ' Transactions' for the current year I find a short paper by James McNeoll, forester, of Abercairney, Crieff, which makes no mention of the Hylobius as a primary agent of destruction, but dwells largely on the physiological conditions required for a healthy plantation, and observes, incidentally, that the plants in crowded plantations become sickly and etiolated, and thus ' the languid circulation of the tree in summer invites the attacks of a species of beetle, whose ravages destroy the foliage, thus impairing the wood-producing foliage or power of assimilation.'—P. 8.

" Brown, in the ' Forester,' second edition, 1849, does not notice the beetle at all, but in the most recent work I can find on the subject, intituled ' The Larch Disease,' by Charles McIntosh, Blackwood, 1860, it is mentioned, among ' the accidental misfortunes the larch is liable to,' as evidently a very minor cause of the mischief so extensively prevailing in larch plantations, but its operations are limited ' to attacks on newly-planted larch, or such as are sickly.'—P. 113.

" The main causes of decay, according to these authorities, are:—

" 1. The employment of bad seed, the produce of sickly or unhealthy trees. The larch appears to have been indiscriminately and very extensively planted on all kinds of soil. Many of these, particularly rich low-lying soils and undrained wet lands, are uncongenial to the nature of the tree, and the plantations have failed more or less accordingly, exhibiting what is called ' dry rot or decay at the heart.' It seems to be a fact that unhealthy trees produce a larger crop of cones than sound ones, and hence much bad seed has been gathered and distributed.

" 2. Plantations on the old red sand-stone formation invariably fail; and this rock is very prevalent in Scotland.

" 3. Plantations of larch on ground previously occupied by other coniferous trees, or indeed any trees, also fail.

" There is no doubt that larch timber has been much infected by what the foresters call ' dry rot ' or decay at the heart, and probably the use of low, or rich, or wet soils may have been the occasion of this. I am also prepared to admit that mischief may have resulted from the employment of morbid seed. But I believe the attacks of this beetle have had far more to do with the destruction of trees than has hitherto been suspected. My present forester, a native of Sutherlandshire, says he has been familiar

with the attacks of the beetle in the north for the last ten years. It has certainly been unknown in the south, where I now am, until within two or three years, and now it is swarming in every wood. Six years ago, when on a visit from India to my father-in-law in Ayrshire, the Hylobius was pointed out to me by the old forester at Blairquhan as a recent scourge which had just made its appearance. It appears, therefore, to have travelled from the north gradually towards the south. Several persons here whose attention I have drawn to the subject, and who have consequently directed observation more carefully to the matter, have been struck with the extent of the damage inflicted by the beetle on the woods around, which they had previously attributed to such-like vague causes as dry rot, fungus, ulcers, &c., and I am persuaded that more careful investigation will invest the ravages of the Hylobius with a degree of importance they have not hitherto received.

"By this post I send you a small box containing specimens of the beetle of both sexes. One pair at least were captured in conjunction. I also send pieces of a stem of a young larch, showing how completely they have gnawn the bark. I find trees of all ages are attacked by them. On large trees the twigs that have been gnawn wither, but the rest of the tree looks healthy. Branch after branch, however, is destroyed, and then the top withers and the trunk dies. The numbers of the beetles are so great that I can suggest no means for destroying them. They are evidently on the increase, and will soon leave not a larch alive. I have also found them attacking the spruce occasionally.

"Have you been able to make any more discoveries of the habits of the Hylobius from the German work you showed me? I should be glad of any hints you can give me to direct further examination of the subject. As far as I can observe, the breeding season is now begun, but I have failed to discover any eggs or larvæ."

October 1, 1860.

H. T. Stainton, Esq., V.P., in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'The Journal of the Royal Agricultural Society of England,' vol. xxi. Part 1; presented by the Society. 'Proceedings of the Royal Society,' vol. x. No. 40; by the Society. 'Mémoires de l'Académie Imperiale des Sciences, Belles-Lettres et Arts de Lyon,' Classe des Sciences, Tomes viii and ix.; Classe des Lettres, Tome vii.; by the Academy. 'Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie de Lyon,' Tomes ii. and iii.; by the Society. 'Exotic Butterflies,' Part 36; by W. W. Saunders, Esq. 'The Journal of the Society of Arts' for September; by the Society. 'The Zoologist' for September; by the Editor.

Election of a Member.

M. Deyrolle, of Rue Rivoli, Paris, was balloted for, and elected a member of the Society.

Exhibitions.

Mr. Janson exhibited specimens of Epitrix Atropæ, *Maerkel*, *Foudras* (Crepidodera Atropæ, *Allard*), taken on Atropa Belladonna, near Arundel, by Mr. Wollaston and the Rev. Hamlet Clark, on the 8th ultimo. He remarked that several examples of this species, new to the British list, had been found a few days previously in the same locality by Mr. John Gray, and he had this morning heard from Mr. S. Stevens that specimens, reported at the time as the E. pubescens of Panzer, were taken by Mr. H. Francis near Reigate, on the 22nd of June last. He also remarked that this insect, considered by the older entomologists as a mere variety of E. pubescens, and beautifully figured as such as far back as 1803, by Sturm in the 'Entomologische Hefte,' was first signalised as a distinct species by Herr Maerkel, and that the late M. Foudras of Lyons had described it in his extraordinary work 'Altisides de France,' and pointed out the differences between it and its near allies Epitrix pubescens, *Panz.* and E. intermedia, *Foudras*; and further that the genus Epitrix is not accepted by by M. Allard, in his 'Essai Monographique sur les Galerucites Anisopodes, *Latr.*, ou Description des Altises d'Europe et des bords de la mer Méditerranée,' of which the first portion has recently appeared in the 'Annales de la Société Entomologique de France,' who places the E. pubescens and E. Atropæ at the end of the genus Crepidodera, remarking with respect to the latter that "elle n'est peutêtre q'une variété de la pubescens;" but the form of the ædeagus, described by M. Foudras, is so dissimilar in the two insects, and, setting aside size and colour, the difference in the form and sculpture of the prothorax, although in creatures thus minute scarcely perceptible to the unassisted eye, is so apparent under a lens, that he entertained no doubt whatever as to the propriety of considering them good and distinct species.

Mr. Janson also laid before the meeting a box, handed to him for that purpose by Mr. Baly, containing examples of closely allied species of Donacia, Chrysomela and Paropsis: by the side of each specimen, mounted on card, were placed the generative organs extracted from it. He called particular attention to these organs as exhibiting striking differences in species so closely resembling each other as to be readily taken for mere varieties, and to the perfect condition of the insects which had been submitted to this operation, showing that with a little practice and care the most valuable insects may be thus treated without injury.

Mr. Stevens exhibited two examples of Diachromus germanus, taken at Hastings a few years ago; and a specimen of Coptodera massiliensis, found alive in the street at Hastings many years since by Mr. Rankings.

Mr. Waterhouse considered this latter insect had most probably been imported amongst foreign plants.

Mr. Stevens also exhibited a small collection of insects of various orders made by Mr. Oxley in New Zealand; a large box of Coleoptera and Lepidoptera from the vicinity of the Cape of Good Hope, sent home by Mr. Trimen; and a fine Goliathus allied to G. Derbyanus, from the interior of Africa, likewise forwarded to this country by Mr. Trimen.

Mr. Westwood exhibited a box of exotic Lepidoptera, recently obtained in Paris, containing many rare and interesting species, especially several collected by M. Lorquin in the Philippine Islands, including Papilio Dædalus, Zethera Pimplea (of which the male only had been hitherto known—figured by Erichson—the female now exhibited being totally unlike the male), Debis Lorquinii, a species belonging to the family Satyridæ, but having the wings of the male of a resplendent blue colour; also Morpho Aurora, *Westw.* (a lovely species of great rarity), several brilliant Erycinidæ, a fine new Paphia from Columbia, and a remarkable Adolias from the Philippine Islands; likewise specimens of both sexes of Saturnia Cynthia and S. Ricini, reared at Paris, as well as specimens of both sexes of a hybrid variety reared between the two last mentioned species. Unfortunately, owing to the absence of M. Guérin Méneville from Paris during Mr. Westwood's visit, he had not been able to obtain any detailed account of the circumstances under which these hybrids had been produced, nor had he learned whether they were prolific. M. Guérin himself had given in the 'Annales de la Société Entomologique de France,' 1859 (Proc. p. xlvi.), some account of these hybrids showing their peculiar tendency both in structure and habits to one or other of their parents. On the occasion when this account was given to the French Society, M. Aubé suggested the probability that the two supposed parent species were not specifically distinct, but were, on the contrary, only races due to domesticity, an opinion which Mr. Westwood was induced to adopt, although the circumstances connected with the two supposed species as regarded their food-plants, relative capability of enduring cold, time of pupation, &c., if applied to great numbers of the Micro-Lepidoptera would be regarded by most modern Lepidopterists as decided evidence of distinctness of species. Even supposing these hybrids are not fertile (upon which, however, Mr. Westwood had no information) the fact of the facility with which the species had been crossed seemed to him to show that the parents were more nearly related than if they were really distinct species.

Mr. Lubbock wished Mr. Westwood would confirm by actual experiments his repeatedly expressed opinion that very many of the so-called species, both of Macro- and Micro-Lepidoptera, were mere modifications produced by diversity of food, locality, &c.

Mr. Stainton observed that the hybrid Saturniæ exhibited by Mr. Westwood were larger and finer insects than either S. Ricini or S. Cynthia; he thought such would hardly be the case if they were mere local varieties of one species.

Mr. Syme exhibited a female specimen of Sphinx Convolvuli, which had emerged from the pupa on the 15th ult. It had been produced from a larva found in a potato field at Deal in the autumn of last year, and had remained nearly a year in the pupa state; the eggs contained in the abdomen were, however, extremely small.

Mr. Smith exhibited a specimen of a Danish humble-bee (*Bombus equestris*) caught by Mr. J. Stevens on board a steamer at sea, midway between Hamburg and Lowestoft, and consequently about two hundred miles from land.

Mr. Smith also exhibited two parasites found on Anobium paniceum, received from Dr. Power. The insects, which were a species of Pteromalus, had been found by that gentleman on the Anobia, bred in a preparation of a human arm which had been laid aside for some time.

Mr. Janson observed that he had frequently met with Anobium paniceum associated with a minute Hymenopterous parasite closely resembling, he would not say

identical with that exhibited by Mr. Smith, in druggists' shops, amongst pearl barley and coriander seed.

Mr. Stainton exhibited, on behalf of the Rev. Mr. Hellins, drawings of the larvæ of the nine British species of the genus Melanippe, admirably executed by Mr. W. Buckler. The larvæ delineated had in all instances been bred from the eggs, and were represented both of the natural size and magnified.

Mr. Bond exhibited some Lepidoptera from the Isle of Wight, including a fine example of Leucania vitellina, and the female of Agrotis cinerea, both captured by Mr. Rogers; and a beautiful series of Heliophobus hispida, taken by himself.

Mr. Stevens communicated some extracts from a letter received by him from Mr. R. Trimen, on the Entomology of the Cape of Good Hope.

Mr. Janson said that he was desirous of contradicting a report in circulation relative to Donacia Comari, exhibited by him at the previous meeting as a species hitherto unrecorded as British, to the effect that it is described by the late Mr. Stephens under the name of Donacia Proteus, and had therefore been long known as indigenous. He stated that the facts are simply as follows. *First*, Stephens' Latin diagnosis of D. Proteus is copied *verbatim* from Kunze; his description is an abridged translation from the same author. *Secondly*, D. Proteus of Kunze is identical with D. sericea of Linneus, and has been cited on all hands for the past twenty years as a synonym of that species. *Thirdly*, D. sericea of Linneus and D. Comari of Ahrens and Suffrian (D. sericea, *Ahrens olim nec Linn.*) being a distinct species it is obvious that Stephens' description cannot refer to D. Comari. Moreover the "prominent anterior angles of the thorax" of Stephens' description of D. Proteus apply incontestably to D. sericea of Linneus and not to D. Comari, which has those angles obtuse and deflexed.

Supposed new Species of Nonagria.

Dr. Knaggs exhibited some specimens of an undescribed species of Nonagria? taken at Folkestone, and read the following remarks and description:—

"It may be recollected that specimens of Nonagria concolor were taken for the first time in this country at Whittlesea Mere, in the year 1849, and for the last time, in the same locality, in 1850. The spot was afterwards destroyed by fire, and subsequently cultivated, since which the insect has been seen no more. Its time of appearance was June, and it came to 'sugar.' In 1859, at Folkestone, I captured specimens of a Nonagria which bore considerable resemblance to this species, and which was returned by M. Guenée as N. concolor. Through the kindness of my friends Messrs. Doubleday and Bond, who have lent me specimens of the true N. concolor for comparison, I am enabled to give the following characteristics, which I think justify the acceptance of my specimens as a species totally distinct from Nonagria concolor, and new to Science. In the following remarks I shall designate my specimens Nonagria Bondii.

"In addition to the larger size of Nonagria Bondii, and the difference in colour, the fore wings being constantly paler, the hind wings darker in N. Bondii than in N. concolor, there are other distinguishing characters. In shape N. concolor approaches that of a Glæa, N. Bondii that of a Noctua; for instance, the costa of the fore wings in N. concolor presents from the base to the middle a convex curve, and for the rest is straight, or if anything even slightly concave; while in N. Bondii there is a gradual

convex curve from base to apex; if there is any straightness or approach to concavity it is on the basal side of the middle of the costa. Again, the hind margin of the fore wings is considerably more angulated in N. concolor than in N. Bondii; in the latter the curve is much less abrupt, gradual, and in some cases inappreciable. The costa and inner margin are also more parallel in N. concolor, and there is consequently less breadth of the fore wings from the costa to the anal angle; and the breadth at the insertion seems also greater in proportion in N. concolor than in N. Bondii. The hind wings are much more oval in N. Bondii, and are devoid of a concave notch a little below the costa which is constant in N. concolor. The general appearance of N. Bondii is much more slender than that of N. concolor, especially as regards the proportionate size of the thorax. The antennæ are much longer, legs darker, larger and much less hairy in N. Bondii than in N. concolor, indeed in the former the legs are comparatively almost naked. With respect to markings, there is a constant dotted line more or less distinct at the insertion of the cilia in the fore wings of N. concolor, totally wanting in N. Bondii. There is on the other hand a constant shade in the centre of the hind wings in N. Bondii, absent in N. concolor; and while the under surface of the fore wings is dark sooty gray in N. Bondii, it is pale brownish gray in N. concolor; this, too, applies to a certain extent to the under side of the hind wings, in which however other differences are visible. The palpi of N. concolor are larger, stouter and much more thickly clothed with scales than in N. Bondii, although the latter is the larger insect, and the palpal scales show considerable difference respectively under the microscope. The down from the tippet is very diagnostic under the microscope in N. concolor; each scale at its free end is notched with four or five deep serrations, while in N. Bondii these serrations are either entirely wanting or there are two very slight lateral serrations. Scales, from corresponding points in the wings of the respective species, present considerable differences, but owing to the difficulty of obtaining them all of the same size their comparison is not so satisfactory as I could wish.

"The above microscopic observations were made from insects of the same sex, namely, females; and when to these it is added that N. concolor used to appear from the beginning to the middle of June, mine from the end of June to the end of July; that N. concolor is a fen insect, mine a coast insect; that N. concolor used to 'come to sugar,' whereas I never knew N. Bondii to do so until the second flight (about 11.30 P.M.), I think that I have some reason in bringing this forward as a distinct species; and as it is on all sides admitted that if not N. concolor it is new to Science, I beg to maintain the latter, and propose for my insect the name of

Nonagria? Bondii.

Alis anticis amplioribus, ovato-triangularibus concoloribus osseo-albis, serie punctorum semicirculari inter marginem posteriorem mediumque ductâ, subtus tenebrosis; alis posticis ovatis fumeo-cinereis umbra centrali tinctis; fimbriis candidis; thorace et abdomine tenuibus; antennis longioribus.

Exp. al. 1 in. 2 lin. ad 1 in. 3½ lin."

Ravages of Hylobius Abietis.

Mr. Janson communicated the following extracts from a letter which he had addressed to Mr. Walter Elliott, of Wolfelee, Hawick, N.B., in reply to his request

for information relative to the economy of Hylobius Abietis, and the plans best adapted to arrest the ravages of this beetle:—

"London, Sept. 18, 1860.

"My dear Sir,—Your favour, accompanied by specimens of Hylobius Abietis and twigs of larch from which they had gnawn the bark, reached me in due course on the 3rd. The interesting remarks on the ravages of the beetle, and the specimens, were communicated to the Society at its meeting on the same evening, and an account will appear in the 'Proceedings.'

"Having ransacked such foreign works as I possess which treat on insects injurious to foresters, for information respecting the Hylobius, the following memoranda will perhaps prove not altogether unacceptable.

"This beetle appears to attack indiscrimately all the species of fir cultivated in Germany, preferring however, according to Ratzeburg, Pinus sylvaticus and P. abies. In countries where firs are not grown this insect seems to be unknown.

"It is the perfect insect alone which is directly injurious. It gnaws the young shoots, causing them to wither. The extremities of a tree thus attacked (the most vigorous and healthy trees are invariably selected by the beetle) several years in succession, sickness and death inevitably ensue; in dry seasons especially, the mischief this beetle occasions in fir woods where it abounds, is almost incredible.

"The perfect beetles emerge from May to October, and copulation takes place from the period first named to about the end of June, but is rarely witnessed later in the year: the beetles which make their appearance after this time hybernate, and do not copulate until the ensuing spring. The female deposits her eggs, and the larvæ subsist, either in the stems of sickly or dead, standing or felled trees, or in the stumps and roots of those which have been felled remaining in the ground, and are therefore scarcely to be considered as directly injurious. Hence it will be obvious that by grubbing up all stumps, and keeping the plantations cleared of all sickly and dead trees, an important step will be made towards reducing the numbers of the beetles. All timber should be barked as soon after it is felled as practicable, as the females lay their eggs in the bark only. All dead branches likewise should be lopped off close to the stem.

"Ratzeburg mentions several plans adopted in Germany for entrapping the beetles: of these the most successful appear to be—

"1. Pits and trenches with perpendicular sides, dug at frequent intervals round the plantations and along the sides of the paths or road-ways, into which the beetles fall or fly, and from which, being unable to escape, they are to be taken and destroyed.

"2. Bunches of young fir boughs laid about the plantations or in the pits. These are to be shaken daily over cloths, and the beetles collected and destroyed. As soon as the boughs commence to dry they prove unattractive, and must be replaced by fresh ones. Ratzeburg informs us that 2500 beetles have been taken daily from 100 of these bunches or bundles.

"3. Strips of fresh fir bark strewn about the plantations with the inner surface downwards allure the beetles in great numbers; on lifting these the insects are found congregated upon and beneath them.

"I remain, &c.,

"Edward W. Janson.

"To W. Elliott, Esq."

Notes on the Habits of a Species of Mantis found at the Cape of Good Hope.

Mr. Smith read the following communication from Mr. Trimen:—

"A Mantis taken on May 13th has, during the two months just elapsed, constructed four nests of eggs, at intervals of about a fortnight. I had the pleasure of seeing her construct one of these, and was rather surprised at her method of proceeding. I used to fancy that the eggs were arranged first, and the structure coated over with cement afterwards; but I found this to be a great mistake. The insect is grass-green, mandibles scarlet, fore tibiæ and tarsi yellow, and band along the abdomen crimson and white. The nest is constructed all in a mass, that is to say, the eggs as they emerge are completely imbedded in a frothy cement so as to be invisible. The emission of the mingled eggs and cement is incessant, and the structure is shaped as it proceeds by the extremity of the abdomen and a sharp trowel-like organ which protrudes from within the abdomen, while the two external filamentous anal appendages are constantly moving over the surface as if to smooth it. The peculiar projection at one end of the nest is the finishing point, and the insect, as if aware that it would drop off if left immediately after formation, sustains the little horn-like process between its anal plates for some minutes, until sufficiently solidified to sustain itself in position. I cannot imagine the use of this curious projection, unless it is to frighten marauding insects or other enemies from devouring the eggs. The eggs, when the cement has dried, give the nest a ribbed appearance: the structure is remarkably firm and hard when dry. The four nests are as nearly as possible of the same size, and of precisely similar shape.

"The manner of devouring the house-flies I feed my Mantidæ with is peculiarly remorseless and sanguinary. Once having seized its prey, with a sudden, embracing stroke of one or both of its powerful fore legs, the Mantis conveys it to its mouth, and immediately commences to devour it. There is no preparatory wounding or stupefying of the unfortunate victim; the devourer eats regularly down, generally commencing at the eyes, the unfortunate fly struggling to the last bit of muscle he has left; the fly's legs are always devoured, his wings but rarely. The Mantis when hungry would catch and eat portions of 'bluebottles,' but generally dropped it half-devoured, and always if I introduced an ordinary fly. One very large Musca vomitoria that the Mantis attacked, after she had just finished a nest, actually dragged the Mantis round the box, she devouring the back of its thorax all the time! These remarks may probably have nothing but their accuracy to recommend them."

November 5, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Patent Office Reports: Agriculture,' for 1857, 1858, 1859; presented by the United States Government. 'Twelfth Annual Report of the Ohio State Board of Agriculture, with an Abstract of the Proceedings of the County Agricultural Societies to the General Assembly of Ohio: for the year 1857;' by the Board. 'Annual Report of the Board of Regents of the Smithsonian Institution, shewing the Operations, Expenditures and Condition of the Institution for the year 1858'; by the Institution. 'Proceedings of the Boston Society of Natural History,' Vol. vi., Sheets 23—28; Vol. vii., Sheets 1—9; by the Society. 'Bibliographia librorum Entomologicorum in America Boreali Editorum;' by the Author, W. Shaiswood. 'Sitzungsberichte der Konigl. bayer. Akademie der Wissenschaften zu München,' 1860, Heft 1 and 2; by the Academy. 'The Zoologist' for November; by the Editor. 'Journal of the Society of Arts' for October; by the Editor. 'The Farm and the Garden,' Vol. ii. Nos. 19—21; by C. A. Wilson, Esq. 'The Athenæum' for October; by the Editor. 'De la Chasse des Hymenoptères;' by the Author, Dr. Sichel. 'The Journal of Entomology,' No. 2; by the Proprietors. Four specimens of Heliophobus hispidus; by F. Bond, Esq.

Exhibitions.

The President exhibited Mycetoporus angularis, *Rey and Mulsant*, a species not hitherto announced as British, which he had taken in the mud on the coast near Shoreham, Sussex, on the 7th ult.: he observed that the above authors described the sixth segment of the abdomen in this insect as testaceous-brown, which did not agree with his examples; the insect had been previously taken by Dr. Power and Mr. Waterhouse.

Dr. Power sent for exhibition the following British Coleoptera, with the accompanying remarks:—

Mycetoporus angularis, Rey and Muls. Cambridge, 1833. I have seen many other specimens in possession of Messrs. Waterhouse, Douglas, Brewer, &c.

Quedius infuscatus, Erich. Sent to me by Mr. Crotch for determination. Said to be found about nests of Formica fusca.

Ammœcius brevis, Erich. Taken by Mr. Hayward on the sands at Southport.

These three insects, I believe, have not hitherto been announced as British.

Sphindus Gyllenhalli, Chev. Taken by C. Turner, in a fungus in the New Forest. This insect is figured by Spry and Shuckard, and described as found in Sherwood Forest, but does not occur in Stephens or any of our Catalogues; neither have I seen any British specimens except this.

Rhizophagus nitidulus, Erich. Scotland. Distinguished from R. dispar, which I have placed below it for comparison, by its larger size, cylindrical and convex form, the red band at base of the elytra, and especially by the last segment of the abdomen being deeply impressed beneath.

Læmophlæus bimaculatus, Payk. New Forest, August, 1860.

Oxylæmus variolosus, Duf. Taken by myself from rotten fungus grown on a stump at Holme Bush, May, 1860.

Hetærius sesquicornis. Interesting as taken by myself from a new locality (Weybridge), in the autumn (October, 1860), and from nests of F. rufa, instead of those of F. fusca, as at the only other known locality, Hampstead.

Leptinus testaceus. Near London, October, 1860.

Batrisus venustus. Near Croydon, under bark, October, 1860.

Mycetoporus punctus, Erich. Near London, October, 1860.

Philonthus splendidulus, Erich. Scotland, 1860. Possibly sometimes confounded with P. aterrimus, but easily distinguished by having only five thoracic punctures and pale antennæ.

Platyderus dissectus. Taken by the Rev. A. H. Matthews near Nottingham.

Mr. M'Lachlan sent for exhibition a specimen of a new British species of Phryganidæ (Limnophilus borealis of Zetterstedt), identified from a specimen in the foreign collection in the British Museum, from Dr. Hagen; also an example of Agrypnia Pagetana (*Curtis*), taken originally near Yarmouth, and of which very few British specimens are known. Both of these species were taken by Mr. Winter in the Ranworth Fens.

Mr. John Scott exhibited the following Coleoptera, recently captured by himself:—

Leptinus testaceus. Taken in the London district.

Mycetoporus punctus. Ditto.

Philonthus splendidulus. Under bark of oak, at Abergavenny.

Omosita depressa. Under bark, at Crwmlyn.

Mr. Stevens exhibited some splendid Coleoptera, lately received from M. Mouhot, captured by him in Cambodia; amongst them may be mentioned both sexes of Baladeva Walkeri, first described and figured in the 'Transactions' of the Society, and the female, hitherto unknown; a magnificent new Buprestis, equal in size to the largest known species of the family; and a splendid smaller species, also new, and both unique. Mr. Stevens also called attention to some fine new Longicorns and Anthribidæ in the collection.

Mr. Janson exhibited the following Coleoptera, not previously recorded as natives of Britain, *viz*. Bradycellus harpalinus, *Dej.*, Mycetoporus angularis, *Muls.*, and Hylastes cunicularius (*Knoch.*), *Eric.*

Mr. Janson also exhibited the nest of a Hymenopterous insect, apparently a species of Pelopæus, which had been found inside a grand piano-forte sent home from Ceylon to Messrs. Collard & Co., for repairs.

Mr. Waterhouse read a paper intituled "Notes on Chrysomelidæ in the Linnean and Banksian Collections."

Mr. Walker read "Characters of undescribed Lepidoptera in the Collection of W. Wilson Saunders, Esq."

Part vii. of the current volume of the Society's 'Transactions' was on the table.

December 3, 1860.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Nouveaux Mémoires de la Société Impériale des Naturalistes de Moscou,' Tomes xi., xii. and xiii. 'Bulletin de la Société Impériale des Naturalistes de Moscou,' 1859, Parts 2, 3 and 4; 1860, Part 1; presented by the Society. 'Bibliotheca Historico-Naturalis,' Vol. x. Part 1; by the Author, E. Zuckold, Esq. 'Tijdschrift voor Entomologie,' Vol. iii. Parts 4, 5 and 6; by the Entomological Society of the Netherlands. 'Stettiner Entomologische Zeitung,' Vol. xxi. Nos. 10, 11 and 12; by the Entomological Society of Stettin. 'Journal of the 'Proceedings of the Linnean Society,' Vol. v. No. 18; by the Society. 'The Entomologist's Weekly Intelligencer,' Vol. viii., and Nos. 205—217; by the Editor. 'The Zoologist' for December; by the Editor. 'Mein Aufenthalt auf Taiti;' 'Reise von Shanghai bis Sidney;' 'Beitrag zur Fauna Dalmatien's;' 'Ueber die ersten Stände von Plinthus Megerlei, *Pz.*;' 'Mein Aufenthalt in Rio Janeiro;' 'Beitrag zur Insectengeschichte;' 'Ueber einen bisher verkannten Laufkäfer, beschrieben von L. Miller: und einen neuen augenlosen Russelkäfer, beschrieben von F. Schmidt: ferner einige von Schmidt in Schischka neu entdeckte Höhlenthiere;' 'Beobachtungen über die Entwicklungsgeschichte der Chionea araneoides von Dr. J. Egger und G. Frauenfeld, nebst Anatomie des Insectes und der Larve von Dr. F. Brauer;' 'Ueber die Sommerbeschäftigung eines Theiles der Bewohner des Wienerwaldes, St. Paul,' Parts 1 & 2; 'Bericht des Henn Custos-adjuncten G. Frauenfeld über den Erfolg der ihm gewordenen Mission die Weltumsegelungs-expedition S.M. fregate 'Novara' als Zoologe zu begleiten;' 'Ausflug nach dem Adamspik auf Ceylon;' 'Notizen über die Fauna Hongkong's und Schanghai's;' 'Notizen gesammelt während meines aufenthaltes auf Neuholland, Neuseeland, und Taiti;' presented by G. Frauenfeld. 'The Journal of the Society of Arts' for November; by the Society. 'The Athenæum' for November; by the Editor. 'List of the Specimens of Lepidopterous Insects in the Collection of the British Museum,' by Francis Walker, F.L.S., &c., Part 21, Geometrites (continued); by the Author.

Election of a Member.

Mons. Henri de Bonvouloir, of No. 15, Rue de l'Université, Paris, was balloted for and elected a Member of the Society.

The President announced that Mr. W. W. Saunders had kindly undertaken to receive the subscriptions from members of the Entomological Society of France resident in this country, and that the 'Annales' of that Society would be forwarded to him, and be delivered to members so paying, at his office, No. 13, Copthall Court, London.

Exhibitions.

Mr. Stevens exhibited some Coleoptera sent from Ceram by Mr. Wallace, including Eucheirus longimanus, Monohammus Grayii, and other fine species.

Mr. King exhibited a singular variety of Camptogramma bilineata, and two specimens of Leucania putrescens taken near Torquay.

The Rev. A. R. Hogan exhibited specimens of Niphargus Kochianus, *Spence Bate*, a species of well-shrimp discovered by him, along with two other new species, at Ringwood, in the New Forest. They were afterwards found in several other places, those before the Meeting being from Upper Clatford, near Andover. One of the most remarkable facts connected with Niphargi was their occurrence in recently-sunk wells; they have in more than one instance been drawn up in large numbers by pumps not two years's sunk. Their organization is of a very high character, but most of the species, both in this country and on the Continent, are destitute of eyes. When in captivity the movements of these Crustacea are exceedingly interesting, being graceful and active, as well as peculiar; but there is great difficulty in keeping them alive for any length of time, owing to their sensitiveness to temperature; a very cold atmosphere at once deprives them of life. The limbs are also very fragile; so that it is difficult to transmit them with safety by post. The size of the largest species as yet found in England, N. fontanus, reaches about half an inch. A description of the British Niphargi and of their habits was made public in the 'Natural History Review and Quarterly Journal of Science' for 1859, in papers by C. Spence Bate, Esq., and the Rev. A. R. Hogan; and a more complete account will be given in the British Museum 'Catalogue of Crustacea,' now in the press.

Mr. Hogan also exhibited a female specimen of Chirocephalus diaphanus, taken at Shaftesbury, in Dorsetshire, last summer, furnishing a new locality for one of our largest and most beautiful fresh-water Crustaceans.

Mr. Lubbock said he was very glad to see some exhibitions which were a little out of the ordinary course. Both the animals now exhibited by Mr. Hogan appeared to be very local. He had himself some time ago brought to a meeting of the Society some blind shrimps from a well at Brighton, and some specimens of Chirocephalus diaphanus from a pond in Kent, between Bromley and Sevenoaks. He believed that the present was the most northern locality in which this beautiful and interesting Crustacean had hitherto been found.

Mr. Lubbock then exhibited some specimens of Campodea Staphylinus, *Westw.*, which he at first supposed to be Neuropterous larvæ. They were found under slices of turnip which had been placed as a trap for Myriapods.

Mr. Lubbock also exhibited some specimens of Sphærularia Bombi, a parasite of the humble-bee, which was first discovered by M. Leon Dufour, and subsequently observed by Siebold. Mr. Lubbock stated that he had himself found these parasites in the females of every species of Bombus which he had examined. As the mature form of this parasite only is known, he was very anxious to obtain some Bombi during the winter, in order to determine, if possible, the process of development, and to throw some light on the manner in which the young parasites effect an entrance into their victims: he should therefore be much obliged to those entomologists who would forward to him any hybernating Bombi which might be found while searching for insects during the winter months.

Mr. Westwood exhibited a singularly pale variety of Alcis repandata, taken by Mr. Daubeny, of Magdalen College, Oxford, the markings forming a link between the typical insect and the variety named "conversaria" by Hübner, the subapical strigæ being very acutely undulated, and preceded by a large, nearly black patch.

Mr. Westwood observed that his attention had recently been drawn to a specimen of Eristalis similis, *Meig.*, presented to the Hopeian collection in Mr Well's cabinet of British insects, in which the head is entirely enveloped in the thin, semitransparent

pellicle forming the true pupa-skin ; the upper part of the head being, moreover, surmounted by the transverse lunate piece of the indurated head-covering of the larva, through which the two horns of the so-called pupa had been protruded. This lunate piece is represented by Réaumur (Mém. iv. pl. 33, fig. 6, d, d) ; and as, in looking at the head from the front, the open space between the upper part of the pellicle and the lunate piece is seen to be traversed by two internal prolongations of the horns, extending to the pellicle itself, it seemed not improbable that these two horns are the antenna-cases.

Mr. Westwood further directed attention to the statement made by Mr. Curtis, that the death's-head moth, on emerging from the chrysalis, has its legs enveloped in thin pellicles, subsequently cast off; and suggested whether this pellicle was not analogous to the thin skin cast by the May flies after their first flight, and which appears equally to be identical with the thin pellicle covering the bodies of the pupæ of coarctate Diptera, such as that of the Eristalis mentioned above. Monsters of this kind are of great rarity, a Noctua described by Müller (' Naturforscher,' St. xiv. pl. 4, figs. 1—3), and a butterfly, Nymphalis Populi, figured by Wesmäel (Bull. Acad. Bruxelles, t. iv. No. 8), being the only recorded instances. A Dytiscus, however, in Mr. Bowring's collection, and an Emperor moth in Mr. Stephens's cabinet in the British Museum, also agree with the preceding, retaining, in the perfect state, the head-covering of the larva.

Mr. Waterhouse exhibited two species of Donacia which he had compared with the Leptura aquatica and L. sericea of the Linnean collection. The latter is the Donacia sericea of modern authors ; the L. aquatica of Linnæus differs in being a rather shorter and stouter insect. In D. sericea the thorax is broadest in front, and considerably contracted behind the middle : the anterior angles are as prominent as the lateral hump or swelling which lies immediately behind them. In L. aquatica the thorax is rather shorter, nearly quadrate, less contracted behind ; the anterior angles are not so prominent as the lateral hump, and this hump is rather smaller ; the surface of the thorax is more rugulose, and the dorsal impression is more distinct. In D. sericea the third joint of the antennæ is elongate-obconic, and decidedly longer than the second ; whilst in L. aquatica the third joint of the antennæ is short-obconic, and very little exceeds the second in length. In both sexes the antennæ are longer in D. sericea than in L. aquatica ; the legs are also rather longer. In L. aquatica the tooth to the hind femora is stouter, and the joints of the tarsi are shorter and broader. Such are the differences which present themselves upon comparing the insect exhibited to the Society, as being similar to the L. aquatica of the Linnean collection, with the Donacia sericea. Mr. Waterhouse could not say whether these differences are all of them constant. The specimen exhibited was taken at Rannoch, in Perthshire.

Mr. Waterhouse observed that since the last Meeting he had examined certain Cassidæ in the Linnean collection which might be referred to British species. They were :—

1. Cassida viridis. This is not, as has by many been supposed, the C. equestris, but is the species commonly found by us on thistles, having acute posterior angles to the thorax, and punctate striæ to the elytra. = C. rubiginosa of Bohemann.
2. C. nebulosa = C. nebulosa of Bohem.
3. C. Murræa = C. murræa of Bohem. The rufous-brown variety.
4. C. maculata = C. murræa of Bohem. The green variety.
5. C. nobilis = C. obsoleta of Bohem. Has the margins of the elytra reflexed,

the alternate interstices of the striæ of the elytra slightly raised, and the region of the scutellum depressed.

6. Cassida Vibex = C. nobilis of Bohem. The specimen is apparently discoloured; the whole dorsal surface of the elytra is darkish brown, if we except the second interstice, which is pale, and which no doubt, in the living insect, was occupied by the bright green stripe; the dark colour occupying the first interstice and the 3rd and 4th interstices of the striæ, but stopping considerably short of the apex; the remaining upper parts are paler: the under parts are black, the sides of the abdomen rather narrowly edged, and the apex very narrowly edged with pale. The thighs are black, excepting at the apex, and the tibiæ and tarsi are piceo-testaceous (the anterior tibiæ piceous), which is unusual. The expanded margins of the elytra are deflexed. Mr. Waterhouse considered that this must have been the C. nobilis of the 'Fauna Suecica,' and does not really represent that described by Linneus under the same name.

Mr. Rye exhibited a specimen of Choleva spadicea found in a fungus at Coombe Wood.

Dr. Knaggs exhibited some eggs of a Lepidopterous insect from which small Hymenopterous parasites, apparently a species of Mymar, had emerged; and some eggs of Sesia bembeciformis found deposited on a sallow-leaf.

Mr. Stevens exhibited some small Staphylinidæ recently found in moss, including Evœsthetus scaber, Acidota cruentatus, Stenus fuscicornis? and Syntomium æneum.

Mr. Waterhouse read a paper intituled "Notes on the Species of Triplax of Stephens's 'Illustrations' and Collection."

January 7, 1861.

J. W. Douglas, Esq., President, in the chair.

Donations.

The following donations were announced, and thanks ordered to be presented to the donors:—'Tijdschrift voor Entomologie,' Vol. iii. Part 4; presented by the Entomological Society of the Netherlands. 'Abhandlungen de Mathemat-Physikalischen Classe der Koeniglich Bayerischen Akademie der Wissenschaften,' Vol. viii. Part 3. 'Denkrede auf Alexander von Humboldt;' 'Sitzungsberichte der Königl. bayer. Akademie der Wissenschaften zu München,' 1860, Part 3; by the Academy. 'Kongliga Svenska Fregatten Eugenies Resa omkring Jorden Insekter,' Parts 2 and 3; by the Académie Royale des Sciences de Stockholm. 'Papers and Proceedings of the Royal Society of Tasmania,' Vol. iii. Part 2; 'Report of the Royal Society of Tasmania' for 1858; by the Society. 'Proceedings of the Royal Society,' Vol. x. No. 41; by the Society. 'British Butterflies: Figures of every Native Species, with an Account of Butterfly-development, Structure, Habits, Localities, Mode of Capture and Preservation, &c.,' by W. S. Coleman; by the Publishers, Messrs. Routledge, Warne and Routledge. 'Monograph of Halticidæ in the Collection of the

British Museum,' by the Rev. Hamlet Clark, M.A., F.L.S., Physapodes and Œdipodes, Part 1; by the Author. 'Exotic Butterflies,' Part 37; by W. W. Saunders, Esq. 'The Zoologist' for January; by the Editor. 'The Journal of the Society of Arts' for December; by the Society. 'The Athenæum' for December; by the Editor. 'Catalogue of British Coleoptera,' by G. R. Waterhouse, Esq., F.Z.S., &c., Sheets M and N, two copies; by the Author. 'The Entomologist's Annual' for 1861; 'The Entomologist's Weekly Intelligencer,' Nos. 218 to 222 inclusive; by H. T. Stainton, Esq.

Election of a Member, &c.

Francis A. Jesse, Esq., of Lanbedr Hall, Derbyshire, was elected a Member; and W. F. Kirby, Esq., of 25, Albert Street, Mornington Crescent, and H. W. Bates, Esq., of King Street, Leicester, were elected Subscribers to the Society.

Exhibitions.

Mr. S. Stevens exhibited some splendid Papilios and other Lepidoptera sent from Ceram by Mr. Wallace.

Mr. Shepherd exhibited a fine dark variety of Hemerophila abruptaria, taken near London.

Mr. Bond exhibited some fine varieties of Dictyopteryx uliginosana and Gelechia subdecurtella from the Cambridgeshire fens; also a fine series of Gracillaria stigmatella, one example being nearly pure white.

Mr. M'Lachlan exhibited an example of Setodes interrupta of Fabricius (*non* Stephens), taken near Taunton by Mr. Parfitt, in 1859; and remarked that this phryganidous insect may be considered as new to Britain, for although Fabricius, in 1792, indicated it as occurring in England, no one appears to have rediscovered it until now.

The Rev. H. A. Pickard exhibited a specimen of Gonepteryx Rhamni, *var.* Cleopatra, taken by John Fellerton, Esq., at Thyrbergh Park, near Rotherham, on the 27th of June, 1860, being the first recorded British example of this beautiful variety.

Mr. Scott exhibited some specimens of Mycetophagus 4-guttatus, *Müller*. The species had been lately found in decaying pea-haulm, by Mr. Douglas and himself. In all about fifty specimens had been secured.

Dr. Knaggs exhibited some eggs of Geometridæ from which hymenopterous parasites had emerged.

Mr. Westwood pronounced these parasites to be Platygaster Ovulorum.

Mr. Gorham exhibited examples of Micropeplus staphylinoides, *Marsham*, and M. Margaritæ, *Duval*, and made the following remarks:—"I believe under the specific name of staphylinoides two species of Micropeplus have been generally mixed in British collections; they are the true M. staphylinoides of Marsham, and M. Margaritæ of Duval. I have therefore attempted to point out the characters by which these species may be separated. In M. staphylinoides the elytra are scarcely a third longer than the thorax; their sides are parallel, and the fourth segment of the abdomen is armed with an acute prominent crest: in M. Margaritæ the elytra are longer, being nearly half as long again as the thorax, their sides rounded, and the disk more convex than in M. staphylinoides; the fourth segment of the abdomen with a small and not conspicuous tubercle. I also beg to call attention to the sexual characters which M. Duval has pointed out, but which appear to have escaped the notice of former authors, viz., the existence of a tooth on the tibiæ of the male. In M. staphylinoides the head of the male is produced into a tooth in front; that of the female is rounded: in M. Margaritæ the head of the male is more acutely toothed; that of the female rounded.

In this respect they may both be separated from the nearly-allied species, M. longipennis, *Kraatz* (M. staphylinoides, *Ktz.*, olim, nec *Marsh.*), which has the head rounded in front in both sexes."

Mr. Ellerton exhibited some pupa-cases of Cerura vinula, showing the thin membranous lining alluded to at the last Meeting of the Society.

Mr. Westwood remarked that these delicate white pellicles, seen attached to the inner surface of the cast skins of lepidopterous pupæ, were probably identical with the skin said by Mr. Curtis to be cast by the death's-head moth after assuming the perfect state. A more careful examination of these pellicles was, however, necessary, as the question really was whether the Lepidoptera on emerging from the pupa cast one or two envelopes,—whether, like the Ephemeræ, they were enveloped in two distinct skins, as indeed the statement of Mr. Curtis implied, thus partially resembling the coarctate Diptera, in which, however, the outer skin of the pupa is only the hardened ultimate skin of the larva ; or whether the limbs of Lepidoptera are not respectively enclosed in a single sheath, the outer surface of which becomes hardened by a glutinous secretion, by which the whole are fastened together into a solid mass.

Mr. Fereday exhibited a living larva, apparently of Triphæna pronuba, which had been found, a short time previously, lying on the snow with which the ground was then covered, and frozen quite hard, but on being removed to a warm room quickly became active.

Mr. Waterhouse exhibited a new British species of Scydmænus, and a series of the British Euplecti, and read some notes on their differential characters.

Mr. Scott exhibited a new species of Coleophora, and read a description of it, proposing for it the specific name of Wilkinsoni, the insect having first been discovered by Mr. T. Wilkinson, at Scarborough.

Mr. M'Lachlan observed that he had found the larva-cases of this species at Dulwich Wood.

How to cure Grease in Insects.

Dr. Wallace read the following paper :—

"The Rev. Joseph Greene has given us (Zool. 6692) his method of curing grease in insects. Other entomologists extract the interior of greasy bodies, with very fine scissors, at a subsequent period after setting, whenever signs of grease are evident. I propose another method, more economical of time, equally certain in action.

"Small greasy insects—as Tineidæ, Tortricidæ, Crambidæ, small Geometræ, Pyralidæ and Bombycidæ—I soak entire in benzole. Of all large insects which may even be suspected of grease, having disarticulated the bodies from the thorax, and labelled according to the plan suggested by Mr. Greene—either of a year's capture or of many years' collecting—I expose such (bodies) to the heat of the fire, on a cork placed at about six inches distance ; and if the grease has previously run into the thorax and spread over the wings, such parts must be further soaked in the manner above recommended for the smaller insects. By exposure on a cork to the fire, the grease, being liquefied and permeating the body, shows itself on the exterior, causing softening and a dark discoloration ; if no such action takes place there is no amount of grease in the interior of the body, and no need to slit open the body as hereafter described. Simple soaking for a few days in benzole will remove the small portion of grease which may be deposited on the exterior of the insect.

"When discoloration and softening ensue, I slit open the body on the under surface and soak in benzole for twenty-four hours ; then, taking say a hundred or more

bodies, I boil them as rapidly as possible in about an ounce or more of benzole (adding a little from time to time) in a water bath, which may be easily composed of a saucepan containing water, in which is placed the covered jar containing the benzole and the bodies. In this process that portion of benzole which had previously soaked into the interior of the slit body, having been brought into close relation with the grease so as to dissolve it, is very readily volatilised; bubbles of gas are seen to effervesce rapidly from the body, currents of boiling benzole rush into and out of the slit body, and the grease is literally washed out. This may be best observed by boiling a single body with a drachm of benzole in a test-tube over a spirit lamp: but if the body be soaked, and not boiled, the benzole in the interior of the slit body dissolves the fat; but, while drying, it percolates slowly through the substance of the body, and deposits again in the interior nearly the whole of the grease previously dissolved, that portion only being got rid of which, being on the exterior layers, is in immediate relation with a surrounding stratum of benzole. The quicker the boiling, the more readily is the grease washed out, but the greater the volatilisation of benzole.

"The bodies are now removed from the hot liquid, washed with fresh benzole, dried on blotting paper, and if exposed again to the action of heat will show no signs of grease. It will be found necessary to test a single body from time to time, the period necessary to extract all the grease varying according to the rapidity of boiling, the strength and purity of the benzole, and the amount of grease in the bodies. The bodies are finally attached each to its corresponding thorax with Canada balsam, liquid glue or gum.

"I think I may safely state that insects thus treated will never grease again.

"This process may be performed in the winter months, when all greasy insects can be cleaned together. It is economical in time and labour, and thorough in its action: it interferes very little with the beauty of the insect.

"That the body is the sole seat of grease is shown by taking a fresh-dried specimen of an insect liable to grease, as Nonagria Typhæ. Disarticulating the body, expose both it and the thorax and wings to the same amount of heat; the body will quickly discolour; the rest of the insect will remain unchanged. Bodies, therefore, should be always heated, while the head, thorax and wings are as yet free from signs of grease. If any doubt occurs as to the question of grease in an insect, its presence is readily tested by the exhibition of the body on a cork placed about six inches distant from the fire. Only very greasy bodies need be boiled; simple soaking will suffice for slight cases. When bodies are very small the passage of a pin breaks them unless soft with grease; I therefore prefer to soak the whole insect as above described."

Dr. Wallace subsequently boiled some greasy bodies of Nonagria Typhæ in benzole contained in a test-tube over a spirit-lamp, and exposed the bodies thus boiled, and others which had not been subjected to the process, to the heat of the fire: the former were unaffected by it, but the latter were rapidly discoloured and became soft.

Mr. Westwood communicated some notes on the time of appearance, in the perfect state, of Acherontia Atropos, furnished by Mr. W. Groves.

Mr. M'Lachlan read a paper intituled "Notes on the Genera Mystacides and Setodes, in the second part of Kolenati's 'Genera et Species Trichopterorum,' with reference to the Species described in the works of Messrs. Curtis and Stephens."

Anniversary Meeting, January 28, 1861.

J. W. Douglas, Esq., President, in the chair.

Messrs. J. W. Dunning, H. G. Knaggs, R. M'Lachlan and G. R. Waterhouse, were elected members of the Council, in the room of Messrs. J. E. Gray, F. Grut, E. Sheppard, and S. J. Wilkinson.

J. W. Douglas, Esq., was re-elected President; S. Stevens, Esq., Treasurer; and Messrs. E. Shepherd and E. W. Janson, Secretaries.

The Report of the Library and Cabinet Committee, made to and adopted by the Council as their Report to the Society, was read and received.

The President delivered an Address on the state and future prospects of the Society and entomological Science, for which the Meeting passed a cordial vote of thanks, and ordered it to be printed in the Society's 'Proceedings.'

A vote of thanks to the retiring Members of the Council was also passed.

Report of the Library and Cabinet Committee, adopted by the Council as their Report to the Anniversary Meeting, 1861.

We have the satisfaction of stating that our Collections and Library continue in good preservation.

In our Report last year we alluded to the very unsatisfactory condition of our Collections of British Coleoptera and other orders, and appealed to our Members to assist in rearranging them in accordance with the modern classifications and nomenclatures: as no response has yet been made to that appeal, we would suggest the propriety of employing some person, if such can be found, able and willing to undertake the task, feeling confident that were the collections properly arranged they would speedily be greatly enriched by donations of specimens from those Members who are engaged in the study of the various groups and orders, and facilitate the study of British Entomology generally.

We would therefore suggest that the sum of ten pounds be expended in repapering the drawers and rearranging the Collection of Coleoptera, and that the specimens presented to the Society by the Rev. W. Kirby be arranged separately, as was done in the case of the Lepidoptera.

J. W. DOUGLAS, *President.*
W. WILSON SAUNDERS.
F. P. PASCOE.
FREDERICK SMITH.
EDWIN SHEPHERD.

THE PRESIDENT'S ADDRESS.

Gentlemen,

Our By-Laws provide that at the Anniversary Meeting the Society "shall receive from the Council, and hear read, the Annual Report on the general concerns of the Society." But our constitution says nothing about an Address to be delivered by the President, and therefore the President for the time being would not fail in his prescribed duties if he did not say a word at the Anniversary Meeting about the affairs of the Society or the progress of Entomology. Yet it has apparently been deemed necessary that the President should make some such statement, and the way in which in different years this has been done is very various. Some addresses have been extemporary, some have been very short, and others very elaborate: what I now purpose to say will not come under either of these heads, and if the few observations I have to make serve no other purpose they will at least fill up the time that must necessarily elapse while the ballots remain open.

Finance.

First, then, I take our finance, for finance is at the root of all material prosperity. Our Treasurer's account shows the receipts of last year (including the balance in hand) to have been £288 12*s.* 8½*d.*, and the payments £183 8*s.* 6*d.*, leaving a balance of £105 4*s.* 2½*d.*; add to this "Arrears of subscription due £9 9*s.*," the balance becomes £114 13*s.* 2½*d.*, from which must be deducted "Amounts due at Chrismas, £48 17*s.* 3*d.*," making the true balance in favour of the Society £65 15*s.* 11½*d.* Contrasted with the balance of last year, £49 13*s.* 2*d.*, this appears favourable, but it must be recollected that we have brought out but three, instead of four, parts of 'Transactions' during the year. The actual income of the Society for the year was £158 5*s.* 6½*d.*, and the expenditure £165 4*s.* 3*d.*; so that, though we have not gone much beyond our revenue, yet an increased income, such as I believe we might easily attain by the method I

shall presently point out, would be entirely devoted to the publication of papers in the 'Transactions.'

There is one item in our balance-sheet to which I feel bound to draw particular attention. The cost of "Tea" amounts to £13 13*s*., and the receipts on account thereof to only £5. This item of "Tea" has always been a vexed question amongst us: many times has it been brought under the consideration of the Council and the Society, always with the result that it was not desirable to discontinue to provide it, and that to defray its cost a special subscription should be relied upon. Year by year this subscription becomes less, and the names of the subscribers fewer, and it seems to me that as the amount has at last become so small, and there is really no authority to pay for tea out of the income of the Society, that if the Members generally do not think fit to subscribe a fund to cover the expense, it would be better to determine that tea shall no longer be provided. A small contribution from each of the Members attending the meetings would be sufficient to defray the cost and keep us on a level with other Societies, but if the subscription this year does not make up the required sum, it will be the duty of the Council to see that the Society's funds are no longer burdened with an outlay for which they are not intended, and of which Members not resident in or near London may fairly complain.

Election of Members.

During the past year we have elected two Honorary Members, viz. Dr. Schaum, of Berlin, and M. Léon Dufour, of Saint Sever, France. We have also elected five Members, viz. M. Bigot, M. Bonvouloir, M. Candèze, M. Deyrolle, F. A. Jesse, Esq., and seven Subscribers, viz. H. W. Bates, Esq., A. E. Crafter, Esq., J. Ellerton, Esq., W. Kirby, Esq., C. Miller, Esq., G. Seaton, Esq., J. C. Young, Esq. On the other hand, we have lost by resignation three Members, viz. Dr. Adams, H. Ansell, Esq., and C. P. Melly, Esq., and two Subscribers, viz., H. W. Brown, Esq., and J. Sang, Esq.

Obituary.

Death has not thinned our ranks during the last year, but he has called away one of our oldest entomologists, who had outlived his generation and still lingered amongst us. Bracy Clark died on the 16th of December, in his ninetieth year, and, although not a Member of this Society, yet as a veteran of the Linnean school and the father

of the Linnean Society, his departure calls for a record of our respect. Mr. Clark published several papers in the 'Linnean Transactions' on the genus Œstrus, the first of which is dated 1797, and he also contributed papers on the same subject to the 'Zoologist.' His only separate work was an 'Essay on the Bots of Horses and other Animals,' 1815.

Library and Collection.

During the past year our library has received accessions of many valuable works, and although still wanting in several books I should like to see on its shelves, we yet possess a very good collection of entomological literature. As you have already learned, by the Report of the Council read to-night, the Council have determined to put the Society's Collection of British Insects into good working order, beginning with the Coleoptera; and as it is very desirable not only to make the collection as complete as possible, but to have fresh specimens, I appeal to the Members who collect Coleoptera to supply our cabinets from their duplicate stores with recent examples of even the common species. I am persuaded they could in no better manner make use of the specimens which at present encumber their boxes, both with reference to the benefit that would thereby be conferred upon young students, and upon the Society as an association whose aim is to advance and diffuse entomological Science.

Monthly Meetings.

The interest attending our monthly meetings does not abate; on every occasion we have exhibitions of new or rare insects, and remarks or discussions thereupon, or upon some subject brought before us. To these I need not more particularly allude, as they are of such recent date, and are duly reported in our 'Proceedings,' and if every one will do his best to bring matter before this Society the interest of our meetings will continue. Several valuable scientific papers have also been read before us, to which, as they have been or will be published in our 'Transactions,' and I shall mention most of them hereafter, I do not now do more than refer to, except to say that they show that the attention of English entomologists is being turned to other orders than Lepidoptera and Coleoptera,—a cheering indication of the progress of Entomology amongst us.

New Apartments.

At the last Anniversary Meeting the Chairman dwelt upon the inadequate size of our meeting-room, and, the pressure on our space having continued, the Council have determined to remove us to larger premises in a central situation, so that within six months from this date I hope to take the chair in a meeting-room where we may breathe freely; and I trust that the expense to which the Society will be put by the removal will be repaid by the addition of many new Members. To advertise "crowded houses" may be a successful attraction for a theatre to use, but, for our more sober recreation, we are about to try the announcement of "room to spare," and surely with this inducement to attend our meetings, a central locality, an excellent library, an improving collection of insects, and the free distribution of our 'Transactions' to every Member, we ought to add largely to our numbers. I hope therefore that every one of us will make known these advantages as widely as possible, and if each individual would, as I think he might, induce but one new Member to join us, the advantages to the Society and to Science would be very great.

British Museum Collections.

Dr. Gray has kindly furnished me with the following particulars respecting the collections in the British Museum:—

"The total number of specimens of Annulosa added during the year 1860 has been 15,101, of which 720 are British: 11,466 were purchased and 3635 presented. The principal donors to whom we are indebted for specimens of British insects are F. Bond, Esq., Henry Cooke, Esq., R. M'Lachlan, Esq., B. Piffard, Esq., Dr. Knaggs, Dr. Power, Roland Trimen, Esq."

In the note conveying the above particulars Mr. F. Smith adds the following remarks:—

"The desirability of a complete collection of British insects being accessible in the British Museum, I think will be obvious to all, and I think it not unlikely that British entomologists will shortly unite for the purpose of forming one. I have heard of such a scheme being on foot amongst our principal Coleopterists, and I would call attention to this in order to stimulate Lepidopterists into a similar undertaking. I hope by this time next year to have to report that

our collection of British Coleoptera is the most complete in the country."

I cordially endorse this statement; I do not think the plan propounded will at all clash with my appeal for insects for this Society's collection, and I believe not only will there be material forthcoming for both collections, but that the two may each have its sphere of usefulness. For, as the Museum closes at four o'clock in winter and at six in summer, only those persons who can go there in the daytime can avail themselves of its advantages, whereas our collections are accessible until seven o'clock every Monday throughout the year, and thus those of our Members who are engaged in business during the day, and I think they are the majority, have here opportunities of examining and comparing insects which the Museum cannot afford, the types, moreover, being their own property; therefore I wish both plans success.

The Hopeian Collection, &c., at Oxford.

The Hopeian Collection of Insects, presented eleven years ago to the University of Oxford, is rich in exotic species, especially from India, New Holland and Africa, and containing extensive series of types described by their several authors,—*e. g.* Cetoniadæ and Buprestidæ, by Gory; Curculionidæ, by Schönherr; Orthoptera (Marchal's entire collection), by Serville; Ichneumonidæ, by Gravenhorst; Chalcididæ, Proctotrupidæ and Aphidæ, by Walker and Foerster; Diptera, by Macquart; &c., &c.,—has almost annually received large accessions from Mr. Hope himself, and in 1857 the entire collection of insects, books and drawings formed by Mr. Westwood were added, when the whole were placed under the charge of that gentleman. Since that time also continual additions have been made, including the whole of Mr. Wollaston's second and enlarged cabinet of Madeiran insects, the whole of Mr. Wells' English and foreign collection, a considerable portion of the Kirbyan Collection, and selections from those sent home by Bates, Wallace, Stevens (Bogota), Squire, Gueinzius, Dupuiset, &c., &c.: many contributions of smaller extent have been received from the Museums of Amsterdam, Leyden and Berlin, and from many entomologists, including Messrs. Baly, Sheppard, Pascoe, Parry, W. W. Saunders, Bree, &c. The collection is also rich in specimens illustrating the natural history of insects and in specimens preserved in spirits.

Hitherto the collections of insects and books have been kept in four spare rooms in the Taylor Institution, waiting the completion of the rooms assigned to them in the New Museum. These are now being fitted with proper tables, cases, cabinets, book-shelves, &c., and it is expected that the collection will be removed in the course of the following summer. The collection is open daily both to members of the University and the public, and is tending, in conjunction with the Entomological Society of Oxford, to awaken and diffuse a love for the Science, especially among the junior members of the University. This Society meets on the first Tuesday in every month during the four academic terms, and the meetings are generally rendered interesting by the distribution of duplicates, exhibition of captures, and notes and observations by the members. Excursions are also made during the spring and summer terms.

British Entomological Works published in 1860.

Our 'Transactions,' published during the past year, contain the following papers :—

"Characters of Undescribed Neuroptera in the Collection of W. W. Saunders, Esq., F.R.S., &c.," by Francis Walker, Esq.

"Notes on the British Species of Cissidæ," by G. R. Waterhouse, Esq.

"Notes on the Economy of the Ichneumons constituting the Genus Pezomachus of Gravenhorst, and Observations on Pezomachus fasciatus," by Frederick Smith, Esq.; with a Description of a New Species of Hemiteles, by Thomas Desvignes, Esq.

"Notes on the British Species of Donacia," by G. R. Waterhouse, Esq.

"Note on the Habits of Scolytidæ and Bostrichidæ," by Alfred R. Wallace, Esq.

"Descriptions of South-African Tineina collected by R. Trimen, Esq., in 1858—9," by H. T. Stainton, Esq.

"Contributions to an Insect Fauna of the Amazon Valley," by H. W. Bates, Esq.

"Notes on the Geographical Distribution of the British Butterflies," by H. T. Stainton, Esq.

"Descriptions of some new Species of Sagra; Remarks on that Genus; and the Characters of Cheiloxena, a new Genus belonging to the same Family," by J. S. Baly, Esq.

"On the Genus Erateina, *Doubleday*, with Descriptions of some new Species," by W. Wilson Saunders, Esq.

"Characters of Undescribed Diptera in the Collection of W. W. Saunders, Esq., F.R.S., &c.," by Francis Walker, Esq.

The Trustees of the British Museum have published the following Catalogues:—

'Lepidoptera Heterocera,' two Parts, by Francis Walker, Esq.

'Catalogue of the Halticidæ,' with ten plates of figures and details, by the Rev. Hamlet Clark, M.A.

'The Lepidopterist's Calendar,' by Joseph Merrin. This work relates only to the British species of Lepidoptera, and may in certain cases be of service to collectors; but it will also help to puzzle them.

'The Lepidopterist's Indicator: an Alphabetically-arranged Guide to the Species of the British Lepidoptera,' by B. Bradney Bockett, M.A., Oxon, Vicar of Epsom, Surrey. To those who adopt the slovenly method of calling an insect by its specific name only, this work may be of use by enabling them to know its genus, if they value such information, which I doubt; and it will also serve the better purpose of referring them to a description or a figure. It proceeds, however, upon the faulty principle of giving as the accepted specific name of an insect, one under which it has not been described; for instance, Gelechia affinis is called affinella,—a name not found anywhere but in catalogues, and of no authority whatever.

'British Butterflies: Figures and Descriptions of every Native Species, with an Account of Butterfly-development, Structure, Habits, Localities, Mode of Capture and Preservation, &c.,' by W. S. Coleman. Essentially different from the work next noticed, as the author has relied upon the coloured figures, rather than the descriptions of the insects, to make his book popular. No doubt he has succeeded, but this is only the way to make collectors and not scientific students. However, there is much to be said for "mere collectors;" and so I do not find fault with a book which has no higher aim than to induce a love of beautiful creations merely for their beauty. As a nation we are far in arrear of other nations in our capacity of appreciating beauty, and anything that has a tendency to cultivate the æsthetical faculty should be welcomed.

'A Natural History of all the British Butterflies,' by Edward Newman, F.L.S., F.Z.S., &c. (being the Butterfly Number of 'Young England'). This contains very careful descriptions, in untechnical terms, of the British butterflies, with a figure of each species beautifully drawn on wood; and the price being only sixpence, the sale has been very great. The work is so well known and appreciated that to say anything in its praise is superfluous.

'A Catalogue of the Lepidopterous Insects in the Museum of Natural History at the East India House,' by Thomas Horsfield, M. & Ph. D., F.R.S., and Frederick Moore, Vol. ii.

'The Honey-Bee: its Natural History, Habits, Anatomy and Microscopical Beauties,' by James Samuelson.

'The Natural History of the Tineina,' by H. T. Stainton, assisted by Professor Zeller, J. W. Douglas and Professor Frey, Vol. v., containing Coleophora, Part 2, witheight coloured plates.

'The Journal of Entomology, Descriptive and Geographical.' Of this new publication two parts have appeared, containing the following articles and eight plates:—

"On the Halticidæ of the Canary Islands," by T. V. Wollaston, Esq., M.A., F.L.S.

"Remarks on the Pollinosity of the Genera Lixus and Larinus," by M. Henri Jekel, Member of the Entomological Soc. of France, &c.

"Characters of Undescribed Species of the Genus Leucopsis," by F. Walker, Esq., F.L.S.

"Description of new Genera and Species of Eumolpidæ," by J. S. Baly, Esq.

"Notices of new or little-known Genera and Species of Coleoptera," by Francis P. Pascoe, Esq., F.L.S.

"Descriptions of new Genera and Species of Exotic Hymenoptera," by Frederick Smith, Esq.

"On the Coleoptera of the Salvages," by T. Vernon Wollaston, Esq., M.A., F.L.S.

"Descriptions of Six new Species of Chrysomela from the East," by J. S. Baly, Esq.

The names of the authors are a sufficient guarantee of the excellence of these papers; I can only regret that the writers have thought proper to contribute them to a new work in no respect differing from

our 'Transactions,' which languish for want of the very support here so freely bestowed. I might quote many letters that I have received upon this subject to show that this is not my own individual opinion; I content myself with an extract from one which conveys the meaning of all the others. My correspondent writes :—"Cannot you get more papers for the Society? Can you tell me why the 'Journal of Entomology' was started, and by whom? I see a second No. is announced; I had hoped the first would have been the last. It is too bad that the writers should starve the Society's 'Transactions,' unless they have some very cogent reasons." The only advantage that I can conceive the authors have is that the papers are published somewhat sooner than they would be in our 'Transactions,' but this could be remedied if we had the matter to publish, for want of matter has sometimes delayed our Parts; and even on the score of expense to the Society, if that were urged as an objection, if the authors contributed something to the Society to insure the rapid publication of their papers, the cost to them, or to the promoters of the 'Journal,' as the case may be, would be much less than that of bringing out a separate publication. Indeed, I think that with the exceedingly numerous entomological publications at present in existence, he who adds another one, without any feature to distinguish it from others, needlessly increases labour and expense to his entomological brethren. Therefore I think the publication of the 'Journal' a mistake; and as the promoters are all members of, and I believe well-wishers to this Society, and, besides, friends of my own, I make these remarks, embodying a very general opinion, with the best feeling, and in the hope that they will be received as they are meant.

'A List of the British Euplexoptera, Orthoptera, Thysanoptera and Hemiptera,' by Francis Walker. For the publication of this List we are indebted to the kindness of W. Wilson Saunders, Esq.; and I sincerely hope it may have the effect intended by that gentleman, of directing the attention of British entomologists to the now neglected orders of insects which it includes.

The Ray Society has just issued to its Subscribers of last year :—

'A History of the Spiders of Great Britain and Ireland,' Part 1, by John Blackwall, Esq., F.L.S. (twelve plates, folio). This elaborate work gives ample descriptions and coloured figures of 110 species of spiders, and descriptions only of several more; and while it

will add to the well-deserved fame of the author, who has devoted many years to his subject, it must do much to advance the study of Arachnology amongst us.

'Farm Insects; being the Natural History and Economy of the Insects Injurious to the Field Crops of Great Britain and Ireland, and also those which infest Barns and Granaries, with Suggestions for their Destruction,' by John Curtis, F.L.S. This is a collection of the articles which the author had from time to time published in the 'Journal of the Agricultural Society' and the 'Gardener's Chronicle,' and are therefore well known to us all.

'The Entomologist's Annual' for 1861, with a coloured plate, contains the following articles:—

Neuroptera.—"Synopsis of the British Phryganidæ," by Dr. Hagen. "Synopsis of the British Psocidæ," by Dr. Hagen. "Some Suggestions for the Successful Pursuit of the Study of the Phryganidæ, with a Description of a new British Species," by Robert M'Lachlan.

Hymenoptera, by Frederick Smith.—"Observations on the Effects of the late Unfavourable Season on Hymenopterous Insects;" "Notes on the Economy of Certain Species, on the Capture of Others of Extreme Rarity, and on Species new to the British Fauna."

Hemiptera, by the Editor.—"A List of British Hemiptera."

Coleoptera, by E. W. Janson.—"New British Species Noticed in 1860."

Lepidoptera.—"New British Species in 1860," by the Editor. "Rare British Species Captured in 1860." "Observations on British Tineina." "Answers to Enigmas." "Enigmas still Unanswered." "New Enigmas for Solution." "Natural History of the Tineina." "Index to the New Lepidoptera in Former Volumes of the 'Annual.'" "Notes on Eupithecia Larvæ," by the Rev. H. Harpur Crewe, M.A. "New Works on Entomology."

The 'Zoologist' contains, as usual, a large amount of interesting entomological matter, chiefly consisting of notices of the capture of new or rare insects, and observations on the habits of various species. I may particularly enumerate the following articles. "On the Functions of the Antennæ of Insects," by Dr. Clemens, in which the author, after making experiments by amputating the antennæ of Lepidoptera, says, "The structure of the organs, together with these

experiments, entirely justify the inference that the antennæ, instead of being the organs of any special sense, as they are usually regarded, are, in Lepidoptera, instruments of atmospheric palpation, having especial reference to the action and use of the wings in flight. This conclusion has been reached contrary to my own preconceived notions of the functions of those instruments; and I believe the view here taken is entirely new. Should the experiments be repeated by any observer, he should be careful to select for experimental study those Lepidopterous insects that are unprovided with simple eyes or ocelli on the vertex at the base of the antennæ. In those species with ocelli on the vertex the flight is deranged scarcely at all, as compared with the effect of antennal excision on individuals unprovided with these organs." This last statement of Dr. Clemens seems to me scarcely to corroborate the theory propounded, for power of directing the flight would seem to be due not so much to the presence of antennæ as to the possession of ocelli, since, if the latter be present, the deprivation of the former does not appear to be of much consequence. The subject clearly requires elucidation, and I hope to hear of further and more conclusive experiments. "Facts Connected with the History of a Wasp's Nest; with Observations upon the Parasite Ripiphorus paradoxus," by S. Stone, Esq., F.S.A., &c. "A List of Micro-Lepidoptera of which the Transformations are Unknown," by Charles Miller; a very praiseworthy paper by a promising young entomologist. "Notes on the British Trichopterygidæ, with Descriptions of some New Species," by the Rev. A. Matthews, M.A. "On the Musical Powers of the British Species of the Genus Acalles," by F. Smith, Esq. "Occurrence of Bagöus nodulosus of Schönherr in Hammersmith Marshes," by E. C. Rye, Esq. The author of this note, by some inadvertence in pointing out the differential characters of this insect, has said that B. binodulus has "on each elytron" four knobs and B. nodulosus only two, whereas it should have been "on the elytra," and not "on each elytron;" yet this slip—evident enough to those interested in the subject—has been elaborately criticised in the 'Entomologist's Annual.' "Note on the Rate of Speed of a Butterfly," by C. Horne, Esq., showing how steam may be beaten by sails, for the clipper insect "Painted Lady" outstripped in speed the steamer "Pera," when going ten and a half knots per hour. The 'Zoologist' also contains a great number of descriptions of Lepidopterous larvæ, very carefully made by the editor; but buried as they are in the midst of other matter, and without much arrangement, their value for reference is greatly detracted from. Hereafter, if the

series attain anything like completeness, it may be worth the author's trouble if he will reprint these descriptions in methodical order and a separate form.

'The Entomologist's Weekly Intelligencer,' vol. viii. This volume, like its predecessors, contains many valuable notices of captures and observations on the economy of insects. But there is also other matter which I confess I should like to have seen, or rather known to have been, shut out by better material. No doubt in a periodical which, like this, must appear at short-stated intervals, many indifferent things are inserted, because the space must be filled; yet it does appear strange to me, that with such a publication specially at their service, English entomologists do not crowd its pages with their observations. Possibly some little alteration in the plan of the paper would be requisite to accomplish this, and I submit this hint for the consideration of the editor; but it is too bad of us not to support better than we do such a disinterested effort on behalf of Entomology as this paper manifestly is.

'Annals and Magazine of Natural History,' 3rd series, vols. v. and vi.:—

"On some new Anthribidæ," by Francis Pascoe, F.L.S., &c., with two plates. (Continued from vol. iv. p. 439).

"On some new Longicornia from the Moluccas," by Francis P. Pascoe, F.L.S., &c.

"On the Aphanarthra of the Canary Islands," by T. Vernon Wollaston, M.A., F.L.S.

"Descriptions of Two British Spiders new to Science," by the Rev. O. P.-Cambridge, B.A.

"On Additions to the Madeiran Coleoptera," by T. Vernon Wollaston, M.A., F.L.S.

"On the Generative Organs of the Scarabæidous Beetles," by C. Roussel. (Translated from the 'Comptes Rendus' of January 16, 1860, p. 158.)

"Characters of some apparently Undescribed Ceylon Insects," by F. Walker, F.L.S. (Hymenoptera. Continued from vol. iv. p. 376.)

"On the Seminal Fluid and Fecundation in the Arachnida," by Emile Blanchard. (Translated from the 'Comptes Rendus' of April 9, 1860, p. 727).

"On Certain Musical Curculionidæ, with Descriptions of Two new Plinthi," by T. Vernon Wollaston, M.A., F.L.S.

"On the Occurrence of Spiders and their Webs in Coal-pits," by R. H. Meade, F.R.C.S.

"Note on some Parasites of Julus terrestris," by M. d'Udekem. (Translated from Bull. de l'Acad. Roy. de Belgique, 2me série, viii. No. 8).

"Descriptions of new Genera and Species of Tenthredinidæ in the Collection of the British Museum," by Frederick Smith.

"Descriptions of Two Coleopterous Insects from Cambogia," by the Barao do Castello de Paiva, Professor of Botany in the Academia Polytechnica of Oporto, &c.

"The Cutting Ant of Texas (*Œcodoma Mexicana*, Sm.)," by S. Buckley. (From the Proc. Acad. Nat. Sciences of Philadelphia, 1860, p. 233).

"On an Undescribed Crustacean of the Genus Myris," by the Rev. Alfred Merle Norman, M.A. (with a plate).

Foreign Entomological Works and Papers Published in 1860.

'Linnæa Entomologica,' xiv. Band. Berlin, contains:—

"Berichtigtes Verzeichniss der bis jetzt bekannt gewordenen Asiatischen Cryptocephalen," von Schulrath Dr. E. Suffrian.

"Monographie der Termiten," von Dr. H. Hagen.

"Die Arten der Gattung Lissomus, Dalm.," von Dr. A. Gerstäcker.

"Das Elachisteden—Geschlecht Laverna," von Professor H. Frey.

"Beitrage zu einer monographischen Bearbeitung der Familie der Emesina," von Anton Dohrn.

"Bibliographia Librorum Entomologicorum in America-Boreali," editorum auctore Guil. Sharswood.

"Beschreibung einiger neuer Chilenischer Schmetterlinge," von Professor Dr. R. A. Philippi.

'Histoire Naturelle des Coléoptères de France' (Mulsant's):—

"Altisides," par Foudras, — Paris.

"Rostrifrères," liv. 10, par Mulsant, Paris.

'Naturgeschichte der Insekten Deutschlands,' Band. 1, pt. 4, Coleoptera, by Dr. Schaum, Berlin.

'Fauna Austriaca,' Diptera, Heft 1 and 2, by Dr. J. Rudolph Schiner, Vienna. This work will contain the characters of all the European genera, and a citation of the European species.

'Terminologia Entomologica,' Heft 1—4, by J. Müller, Brunn.

'Diptera Scandinaviæ Disposita et Descripta,' Tome xiii. xiv., J. W. Zetterstedt, Lund.

'Arcana Naturæ, ou Archives d'Histoire Naturelle,' liv. 1, par J. Thomson, Paris.

'Iconographie et Description des Chenilles et Lépidoptères inedits,' liv. 1, 2, plates, par P. Millière, Lyon.

'Die Europaischen Hemiptera, nach der analytischen Methode bearbeitet,' Heft. 1, by E. X. Fieber, Vienna.

'Entomologie Analytique,' 2 vols., par. C. Dumeril, Paris.

'Die Pflanzen und Raupen Deutschlands,' von O. Wilde, Berlin.

'Correspondenzblatt für Sammler von Insecten, insbesondere von Schmetterlingen,' 1 Jahrgang, Nos. 1—12, Regensburg. A monthly publication, somewhat after the plan of the 'Intelligencer,' conducted by Dr. Herrich-Schäffer.

'Monographie des Elaterides,' Tome 3, par E. Candèze, Liège.

'Genera des Coléoptères,' Tome v., par Lacordaire, Paris, contains the families Tenebrionidæ, Cistelidæ, Nilionidæ, Pythidæ, Melandryidæ, Lagriidæ, Pedilidæ, Anthicidæ, Pyrochroidæ, Mordellidæ, Rhipiphoridæ, Stylopidæ, Meloidæ and Œdemeridæ.

'Entomologische Zeitung Herausgegeben von dem Entomologischen Vereine zu Stettin,' 21 Jahrgang, Stettin, contains :—

Nos. 1—3. Dohrn, "Neujahrs Moralitat." Mitglieder—Verzeichniss. Dohrn, "Rede zur Stiftungsfeier des Entomologischen Vereins." Hagen, "Bericht über die in der Provinz Preussen von 1857 bis 1859 schädlich auf getretenen Insekten." V. Heyden, "Nekrolog über Johann Joseph Maria Becker." V. Heyden, "Mermis antiqua." Hagen, "Neuroptera Neapolitana nebst Synopsis der Ascalaphen Europas." Speyer, "Die Schmetterlinge Deutschlands und der Schweiz, systematische bearbeitet von H. v. Heinemann."

Osten-Sacken, "Classification der Linnobiaceen." Altum, "Hermaphroditen von Sphinx Convolvuli." Freyer, "Lepidopterologie; Gastropacha arbusculæ;" "Naturgeschichte von Thyris fenestrina." Hagen, "Hemerobius (Chrysopa) trimaculata, Girard." A. Dohrn, "Hemipterologische Miscellaneen."

Nos. 4—6. Hagen, "Fragmenta (Micro Lepidoptera)." Pfaffenzeller, "Gastropacha arbusculæ." Suffrian, "Synonymische Miscellaneen (Coleoptera)." Schenk, "Hymenoptera aculeata." Anton Dohrn, "Hemipterologische Miscellaneen" (with a plate). Gerstäcker, "Beschreibung einiger ausgezeichneten neuen Dipteren aus der Familie Muscariæ." A. Dohrn, "Berichtigung." Hagen, "Neuropteren Nord-Amerikas." Mengelbir, "Lepidopterologische Miscellen." Hagen, "Miscellen." Koch, "Lepidopt. Systematischer." Bischoff, "Gastropacha arbusculæ."

Nos. 7—9. Philippi, "Coleoptera Chilensia." Gerstäcker, "Uber Conops." Bertolini, "Camptorhinus statua." Staudinger, "Zur Rechtfertigung." Cornelius, "Lichtreiz der weissen Farbe." Hagen, "Die Phryganiden Pictet's." Gartner, "Limenitis aceris." Dohrn, "Literatur" (Schiner). G. Koch, "Antikritik." Snellen van Vollenhoven, "Uber die Columbatscher Mücke." Dohrn, "Der Weizenverwüster" (Cecidomyia destructor).

Nos. 10—12. Dohrn, "Reminiscere II." Hagen, "Myrmeleon-Arten." Speyer, "Lepidopterologische Beobachtungen." Gerstäcker, "Curculionen." Anton Dohrn, "Zur Heteropteren Fauna Ceylon's." Suffrian, "Synonymische Miscellaneen (Coleoptera)." Pfeil, "Pelecotoma fennica." Freyer, "Gastropacha arbusculæ." Schenck, "Nachträge zu Nassau's Aculeatea." Koch, "Berichtigung." Lederer, "Notiz." Staudinger, "Erklärung."

'Bericht über die wissenchaftlichen Leistungen im Gebiete der Entomologie wahrend des Jahres 1858,' by Dr. Gerstäcker, Berlin.

'Les Lépidoptères de la Belgique, leurs Chenilles et leur Chrysalides, décrits et Représentés,' liv. 1—8 (24 coloured plates), par C. F. Dubois, Brussels.

'Berliner Entomologische Zeitschrift; Herausgegeben von dem Entomologischen Vereine in Berlin.' Vierter Jahrgang (1860). Seven plates, of which one coloured, and portrait of Ruthe; and Catalogue of European Hemiptera Heteroptera, pp. 25.

Contents:—"Ueber die Naturgeschichte des Psychiden," von Dr. Ottmar Hofmann, in Regensburg (Hierzu Taf. i. and ii.)

"Ueber die Artrechte einiger Spanischer Caribi," von Dr. G. Kraatz.

"Die Gattung Cardiomera, Bassi," von Professor Schaum.

"Ueber die europäischen Hirschkäfer," von Dr. G. Kraatz (Erstes Stück).

"Zwei neue Prostemma-arten," von J. P. E. Frdr. Stein, in Berlin.

"Ueber Acanthia intrusa, Herr.-Schffr.," von J. P. E. Frdr. Stein, in Berlin.

"Synonymische Bemerkungen," I., von Prof. Schaum; II., von v. Kiesenwetter; III., von Dr. G. Kraatz.

"Nekrolog on Johan Friedrich Ruthe, and William Spence," by Professor Dr. Schaum. A portrait of the former is given as frontispiece to the vol.

"Zeitschriftschen" (Bibliographical Notices). I. to L.

"Deutsche Braconiden," von J. F. Ruthe (Aus dessen Nachlass veröffentlich), Erstes Stück.

"Das System der Carabicinen," von Professor Schaum.

"Beiträge zur Keuntniss einiger Laufkäfer Gattungen," von H. Schaum, with a coloured plate (III).

"Die Figitiden des mittlern Europa," von H. Reinhard, Medicinal Rath, in Bautzen (Plate IV.).

"Ueber einige Coreïden-Gattungen," von J. P. E. Frdr. Stein, in Berlin.

"Eine neue europäische Heuschrecken-Gattung," von J. P. E. Frdr. Stein, in Berlin (Hierzu Tafel v.).

"Ueber die systematische Stellung einiger Bostrychinen," von. Prof. Dr. Doebner, in Aschaffenburg (Hierzu Taf. vi.).

"Ueber die europäischen Hirschkäfer," von Dr. G. Kraatz (Zweites Stuck, Dazu Taf. vii.).

"Zwei neue europäische Cimiciden-Gattungen aufgestellt," von Dr. C. Stäl, in Stockholm.

"Die Ponera-artigen Ameisen," von Dr. J. Roger.

"H. de Bonvouloir, Synonymische Bemerkungen."

"Kleinen Mittheilungen. Hymenoptera," v. Kiesenwetter, Ueber der Bienen des Hymettus. Coleoptera, I. H. Touris in Genf. Drei neue europäische Käfer-arten; II. Sammelbericht (Lists of Captures), by H. Fuss, in Ahrweiler; Dr. Sandu, in Hildesheim; Tieffenbach, in Berlin; Prömmal, in Berlin; Strübing, in Berlin; v. Twardowsky, in Frankfort; v. M. G. Kraatz; Reiche, in Paris, and

v. Kiesenwetter. Diptera: Stein, in Berlin. Lepidoptera: v. Kiesenwetter.

"Nekrolog. on Johann Christian Friedrich Maerkel," by v. Kiesenwetter. (A lithographed portrait of Maerkel will be published in the next part.)

"Hemiptera Heteroptera Europea Systematica disposita," auctore F. de Baerensprung.

'Glanures Entomologiques, ou Recueil de Notes Monographiques, descriptions, critiques, remarques et synonymies diverses,' par M. Jacquelin du Val (Camille). Cahier 2. Paris: chez M. A. Deyrolle, Naturaliste, Rue de la Monnaie, 19. 18 Mai, 1860.

This work appears at uncertain intervals, and the price of the numbers varies according to the matter they contain. Part 2, the only one to hand in 1860, contains:—

"Essaie Monagraphique sur le Genre Henicopus."

"Supplément au Synopsis des Espèces Européennes du Genre Lampyris."

"Synopsis des Espèces Européennes du genie Cebrio."

"Description de deux Genres nouveaux et d'une Espèce inédite de la Famille des Ptinides."

"Descriptions de deux Espèces nouvelles" (Necrophorus Gallicus et Xenostrongylus Deyrollei).

"Diagnoses provisoires de quelques Genres nouveaux."

"Note sur la Cardiomera Bonvouloirii de M. Schaum."

"Remarques et Notes Critiques sur les Bembidium."

"Remarques et Synonymies diverses."

'Ofversigt af Kongl. Vetenscaps Akademiens Förhandlingar Sextonde Argänger, 1859." Stockholm: 1860.

Contains six entomological papers:

"Holingren, Ichneumonidermas Lefnadsatt."

" „ Sveriges Pimplariæ."

"Stäl, Om Reduvini."

" „ Om Amerikas Chrysomelina."

" „ Om Coreida."

"Wallengren, Skandinavien's Coleophoren."

This last enumerates twenty-eight Scandinavian species of the genus Colcophora; one new species is described under the name of C. Scolopacinella.

'Kongliga Svenska Vetenskaps Academiens Handlingar; Ny Följd.' Andra Bandet; Andra Haftet. 1858.

This was sent from Stockholm, November 18, 1860, by the Académie Royale des Sciences de Stockholm. Contains two entomological papers:

"Stäl, Bidrag till Rio Janeiro-traktens Hemiptera Fauna."

"Holingren, Försök till upstallning och beskrefning af de i Sverige funna Ophionider."

The first part of the second volume of the last-mentioned work, dated 1857, contains a paper by Wallengren on Diurnal Lepidoptera collected by J. A. Wahlberg in Caffraria from 1838—1845, and the first volume contains a Monograph of the Swedish Tryphonidæ, by Holingren, extending to 237 pages.

The Entomological Season of 1860.

In the 'Entomologist's Annual' for 1861 Mr. F. Smith, in a very interesting paper, has recorded the effect of the extremely cold and wet season of 1860 upon Hymenoptera, in producing a scarcity of Aculeata; and he adduces proof that leaves no doubt in one instance, and by inference in others, that the want of heat was the cause of the non-appearance of the species. He says, "In the month of June last I obtained a large number of pupæ of a species of Colletes; these, in the usual progress of development, would appear in the perfect condition about the middle of July; a few came forth in August, but the majority still remain in the larva state." In such a case Mr. Smith does not anticipate any perceptible diminution in numbers next year, but in other cases he expects there will be a great scarcity next season, for he says, "On the 16th September I found a nest of Bombus Muscorum, in which the larvæ had nearly all changed to pupæ, and had perished in that condition, in consequence of the long-continued wet and cold; this, I fear, has been the case with a large majority of the moss-building bees."

But Mr. Smith goes on to say, "I have no doubt of a similar scarcity having been observed in other orders of insects, and that in addition to the questions—What has become of the wasps? What has become of the house-flies? it has also been asked, What has become of the butterflies?" I am glad that for once we have had a scarcity of wasps and flies, although we must all regret that desirable consummation could not be brought about without the loss of the universally favourite butterflies. Yet it would be wrong to suppose

because butterflies were scarce that other Lepidoptera were rare also; I think rather that, of a great many species at least, the examples were not seen for want of opportunity for collectors to seek them. I arrive at this conclusion from the fact the London collectors have this autumn found the larvæ of the larger Lepidoptera in unprecedented numbers, showing that the parent moths had been matured during the summer. In some instances there has been positive proof of the existence, in numbers, of species usually rare, such as Erastria venustula, Deilephila Livornica, Stathmopoda pedella, &c.

In Coleoptera there has been no scarcity of the usually common species, and seldom have so many rare species been captured — in considerable quantity too. I may instance Hallomenus humeralis, Rhynchites truncorum, Mycetophagus 4-guttatus, Badister peltatus, &c. Another season must elapse before we can ascertain whether the "skiey influences" of 1860 have had any effect upon the reproduction of Coleoptera.

In the paper before quoted Mr. Smith says, "Another effect produced by the late summerless year has been a great diminution of the brilliancy in colouring in many species," of which he gives examples. Nothing of the kind, however, has come under my notice among Coleoptera or Lepidoptera; indeed, in the latter order, we we have had before us, at the last meeting, a specimen of Hemerophila abruptaria and one of Gonepteryx Rhamni, var. Cleopatra, captured in 1860, both of which were remarkable for their depth of colour. But I doubt whether great heat is a cause of the intensity of colour in insects, or at least in Lepidoptera, for it is notorious that in many species which occur throughout Britain, the examples from Scotland are much deeper in colour than specimens taken in the south; and again it is well known that in Charicleа Delphinii, which remains from one to seven years in the pupa state, the longer the individuals are in assuming the imago condition the more intense is the colour.

British Entomological Societies.

The establishment of Entomological Societies or Clubs in various parts of the country is a cheering sign of the diffusion of Entomology in Britain. With the exception, perhaps, of the Societies of Oxford and Cambridge, none of these associations aim at a scientific standard, and most of them are exclusively devoted to insects of the order Lepidoptera; yet, as centres of union for collectors, where they may compare notes and captures, and communicate knowledge to each

other, they may do much good service in the working out of the Natural History of the Lepidoptera, and eventually of other orders; for the economy of a vast number of species being still unknown, there is in this department alone a wide field to be explored.

British Entomologists.

Much has been said against English entomologists confining their attention exclusively to the insects of Britain, but the field of Entomology is so vast that it is impossible for any one to obtain more than a very general idea of all the orders of insects in a country, and few of us have either the leisure or opportunity for doing even this. Speaking on this subject lately to a celebrated European entomologist, he said that the only true way for any individual to work with effect was for him to restrict his attention either to one order or one geographical region at one time, and then, in either case, the results would be valuable and satisfactory. Hitherto, in this country, attention has been given chiefly to Coleoptera and Lepidoptera, but I am happy to say that the other orders are gradually coming into favour, and eventually I hope we shall have what has never yet been obtained—a complete insect Fauna of Great Britain.

One more remark and I have done. Collecting has with some persons become such a mania that to form a collection, at whatever cost, appears to be the sole object of their lives. The possessor of a unique specimen prides himself upon having it; the captor of rarities hoards them up, or barters them away with reference to their money value; and others take advantage of the ignorance of young collectors to obtain from them any rare species they may happen to possess. My attention has been so often called to cases of want of honourable feeling and consideration, such as I have alluded to, that I feel bound to give expression to the disgust of all right-minded entomologists at such conduct. A collection of insects, besides being a repository of the most beautiful objects of Divine skill, should also serve to increase and preserve our knowledge of them; but a collection formed on any other principle only becomes a monument of the cupidity and selfishness of its owner.

Another matter which has pained me, and which, I think, deserves the severest reprobation, is the personal altercation and recrimination of entomologists, not only in this country but abroad. "Genus irritabile" is an appellation which bids fair, if this spirit be not repressed, to attach with truth to entomologists as a body; and to my certain

knowledge the unamiable behaviour of some of our body has prevented and still prevents individuals joining our Society. Entomology, and indeed, Science in general, should be, if not holy, at least neutral ground; entomologists should show to the world and to each other that they have learned to differ without acrimony, and that the study of the glorious beauty and harmony of Nature has impressed them with a sense of the utter littleness of personal squabbles. The entomologist to whom a sense of humility and self-negation is wanting, whatever may be his other qualifications, has missed the greatest lesson of his vocation, and is only half a naturalist;

> "For it is alone to students,
> *True and ardent*, are laid open
> Nature's deeply hidden secrets."

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	£	s.	d.
To paid arrears for 1859:—Rent to Christmas 20 0 0			
Messrs. Williams & Norgate, for Books 35 5 3			
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	65	14	9
Rent to Midsummer	20	0	0
Insurance to Lady-day, 1861	2	10	0
Curator for attendance	18	11	0
„ Sundry small payments	0	14	1
Tea, thirteen Meetings	13	13	0
Attendance, Coals, Candles, &c.	4	10	2
Postage, Parcels, Stationery, &c.	5	6	0
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Printing Transactions, three Parts	32	16	6
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Engraving Plates	4	2	6
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Balance in Treasurer's hands	105	4	2½
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The figures refer to the pages of the Transactions, and the Numerals to the pages of the Journal of Proceedings.

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GENERAL INDEX

TO

THE FIVE VOLUMES COMPOSING THE SECOND OR NEW SERIES

OF THE

TRANSACTIONS AND PROCEEDINGS.

Note.—Where the name only of an Insect is mentioned, the description thereof is referred to.

The large Roman Numerals refer to the Volumes; the Arabic figures to the pages of the Transactions; and the small Roman Numerals to the pages of the Journal of Proceedings.

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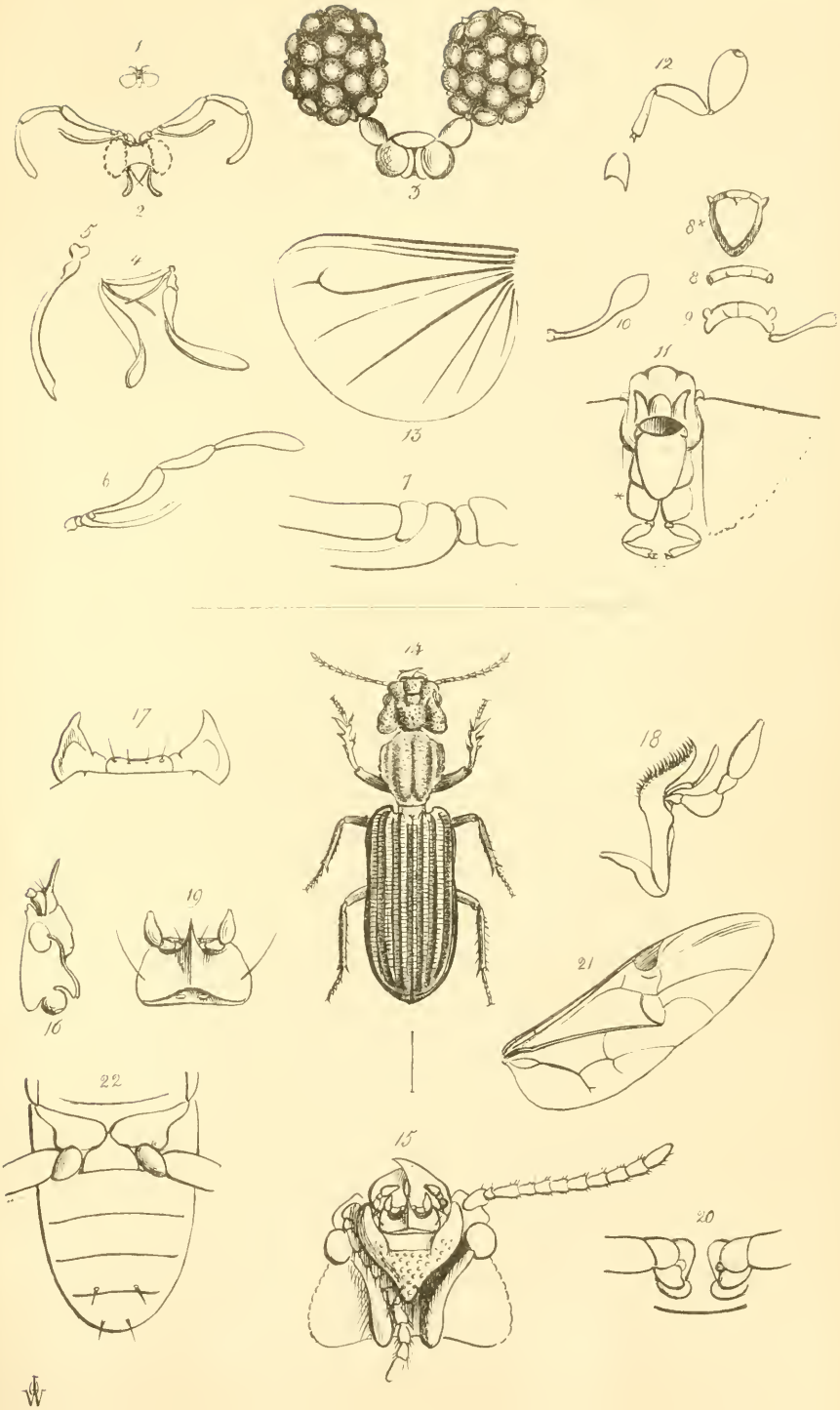
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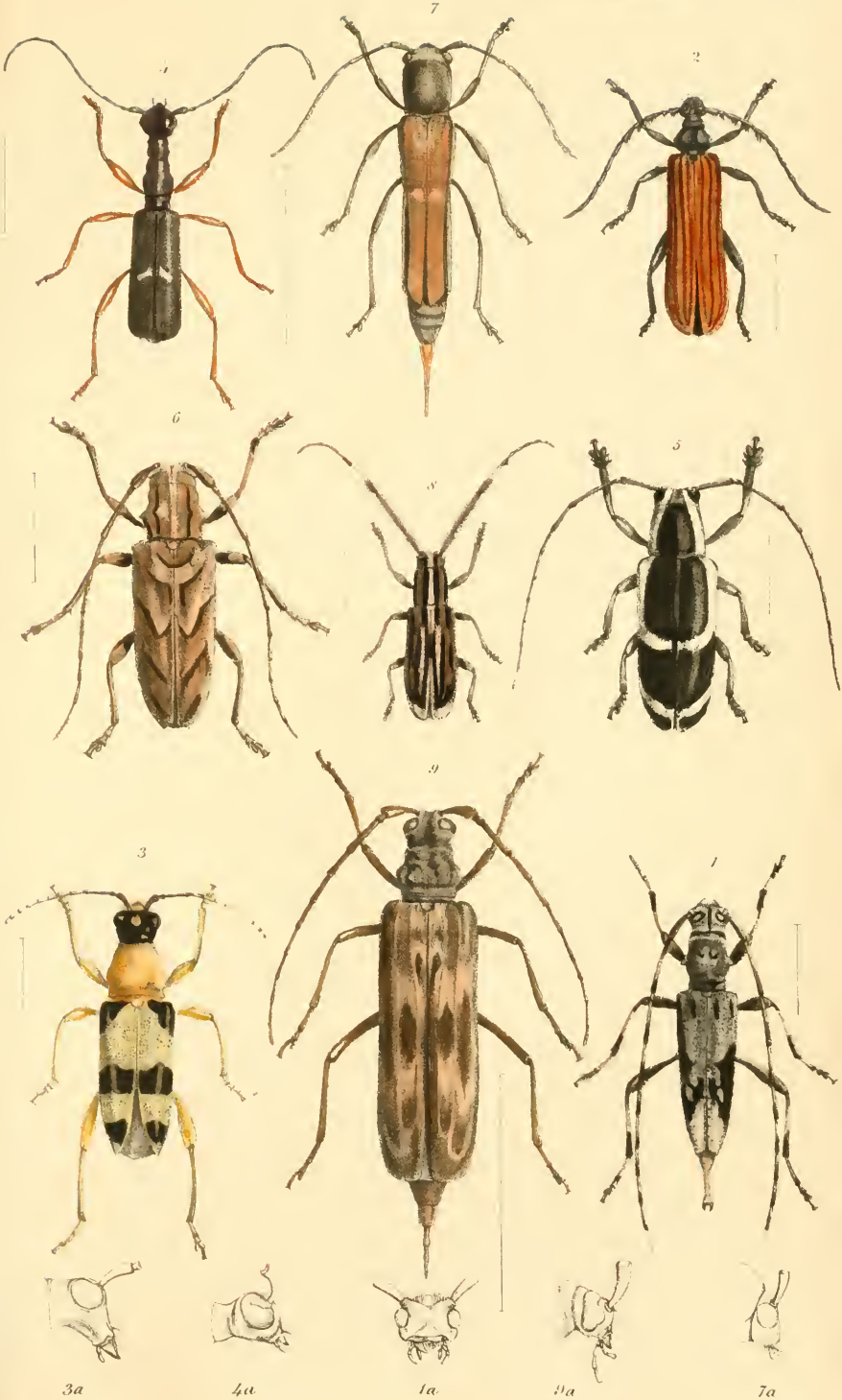

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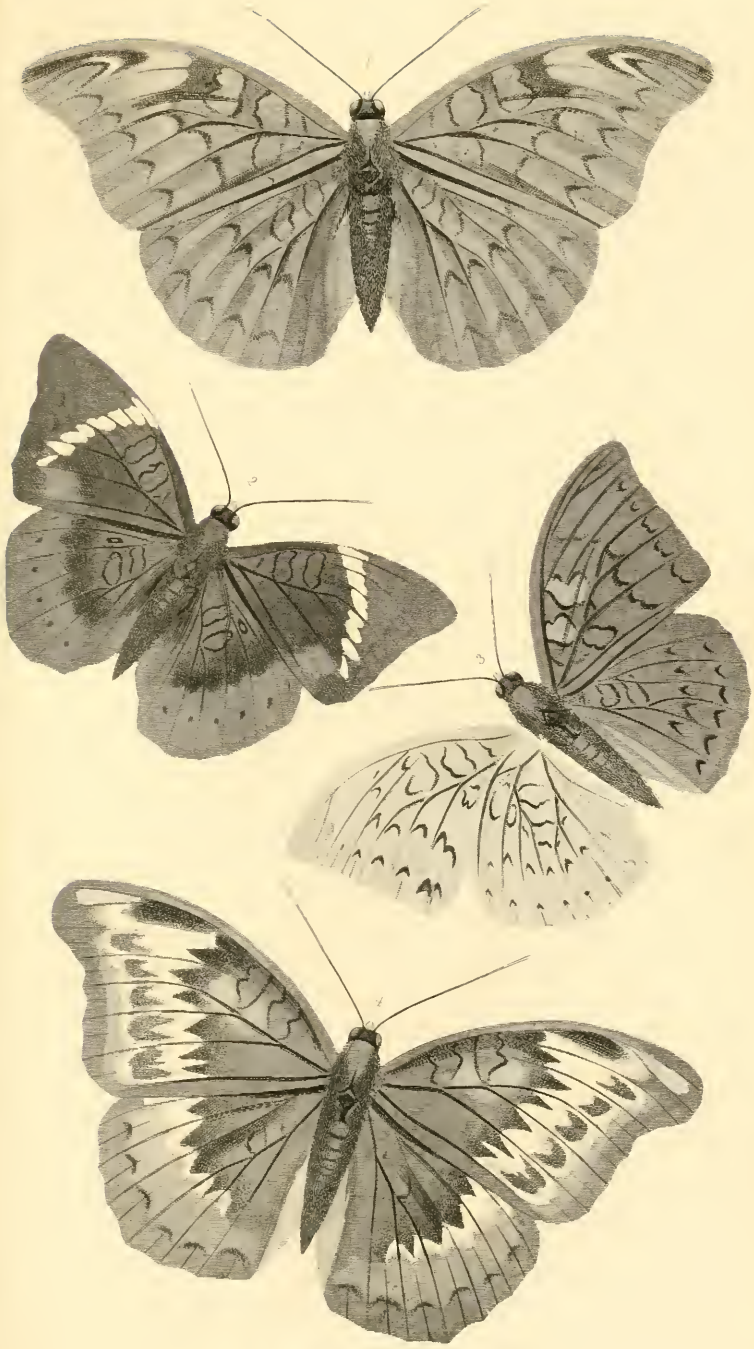

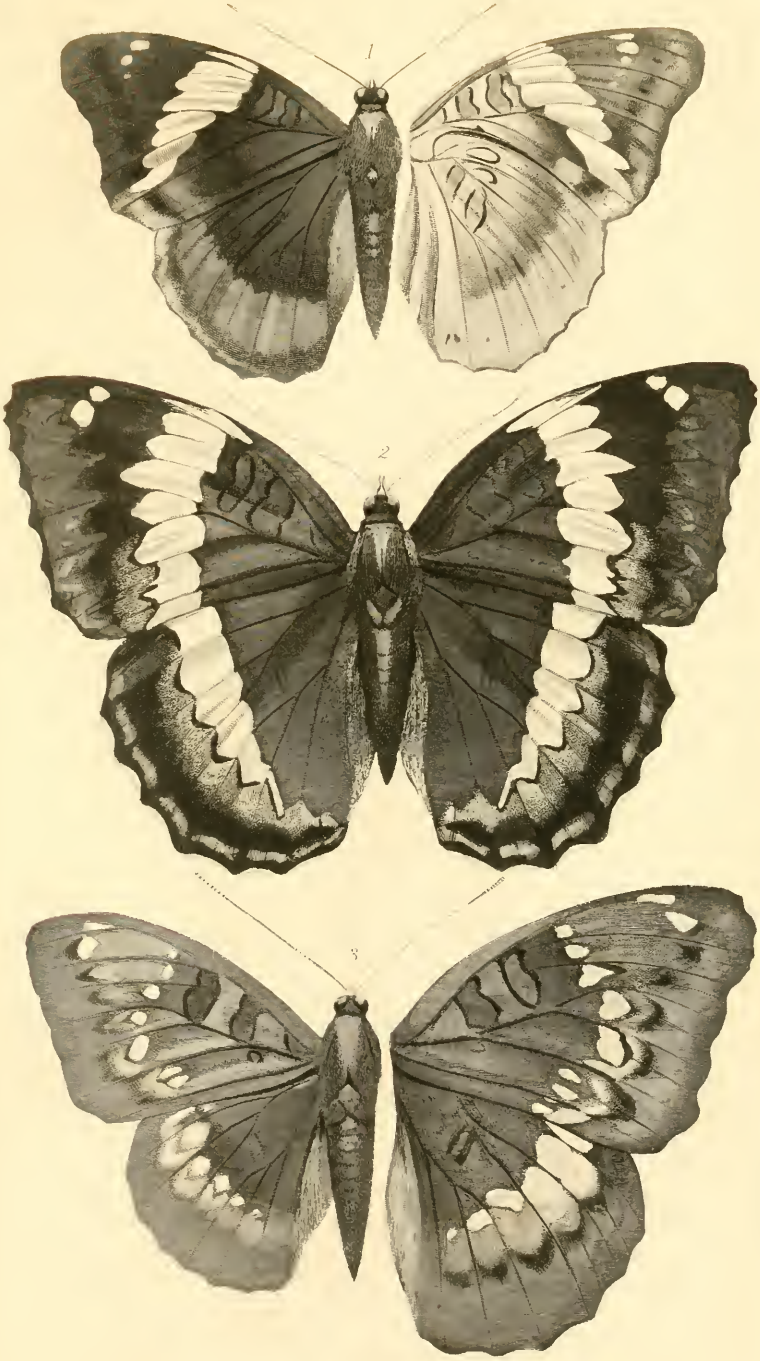
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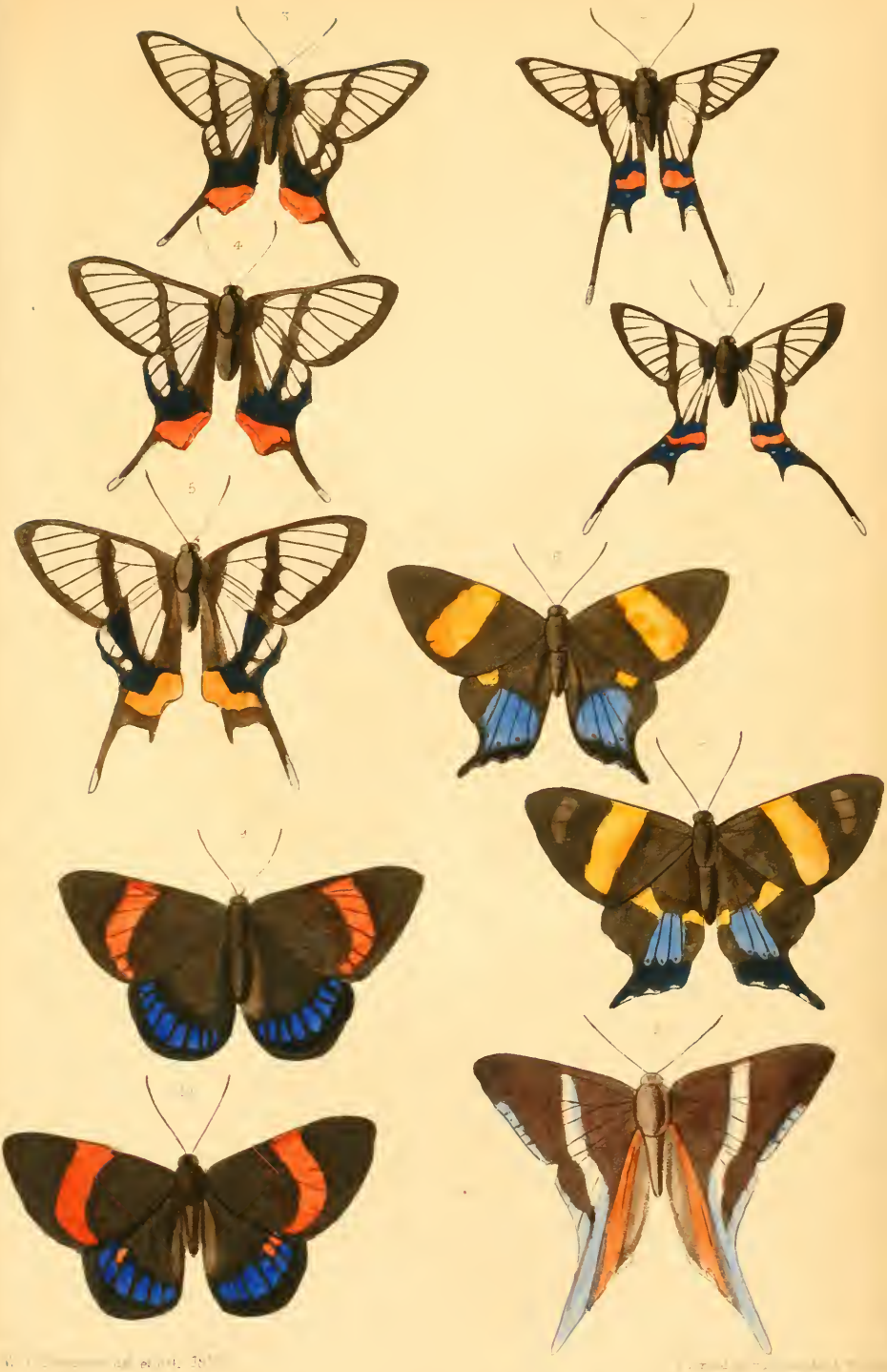

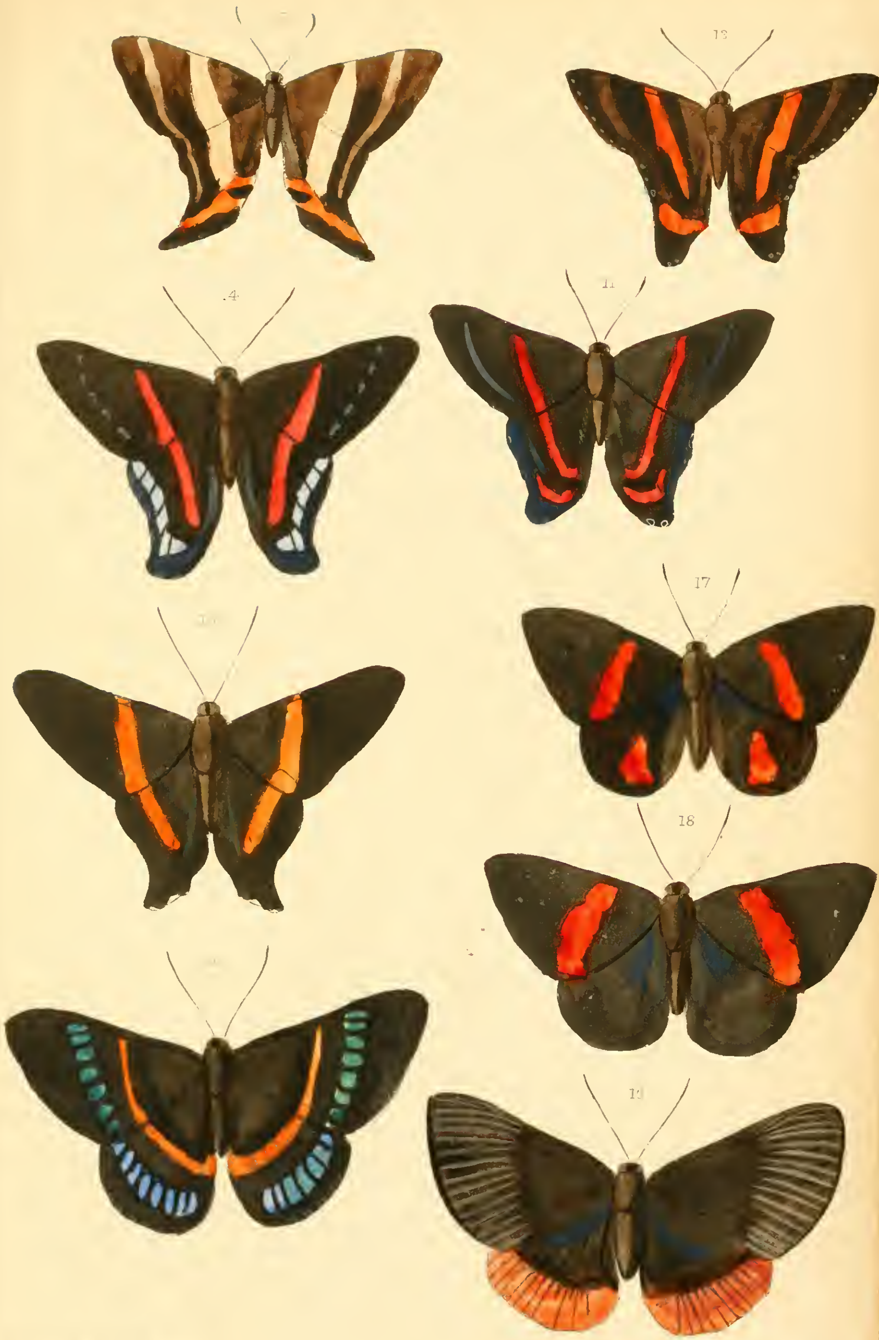

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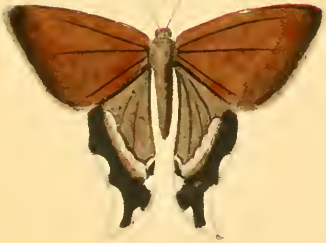

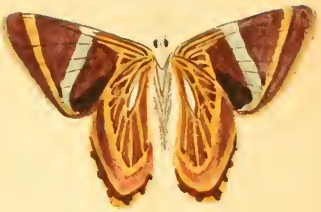

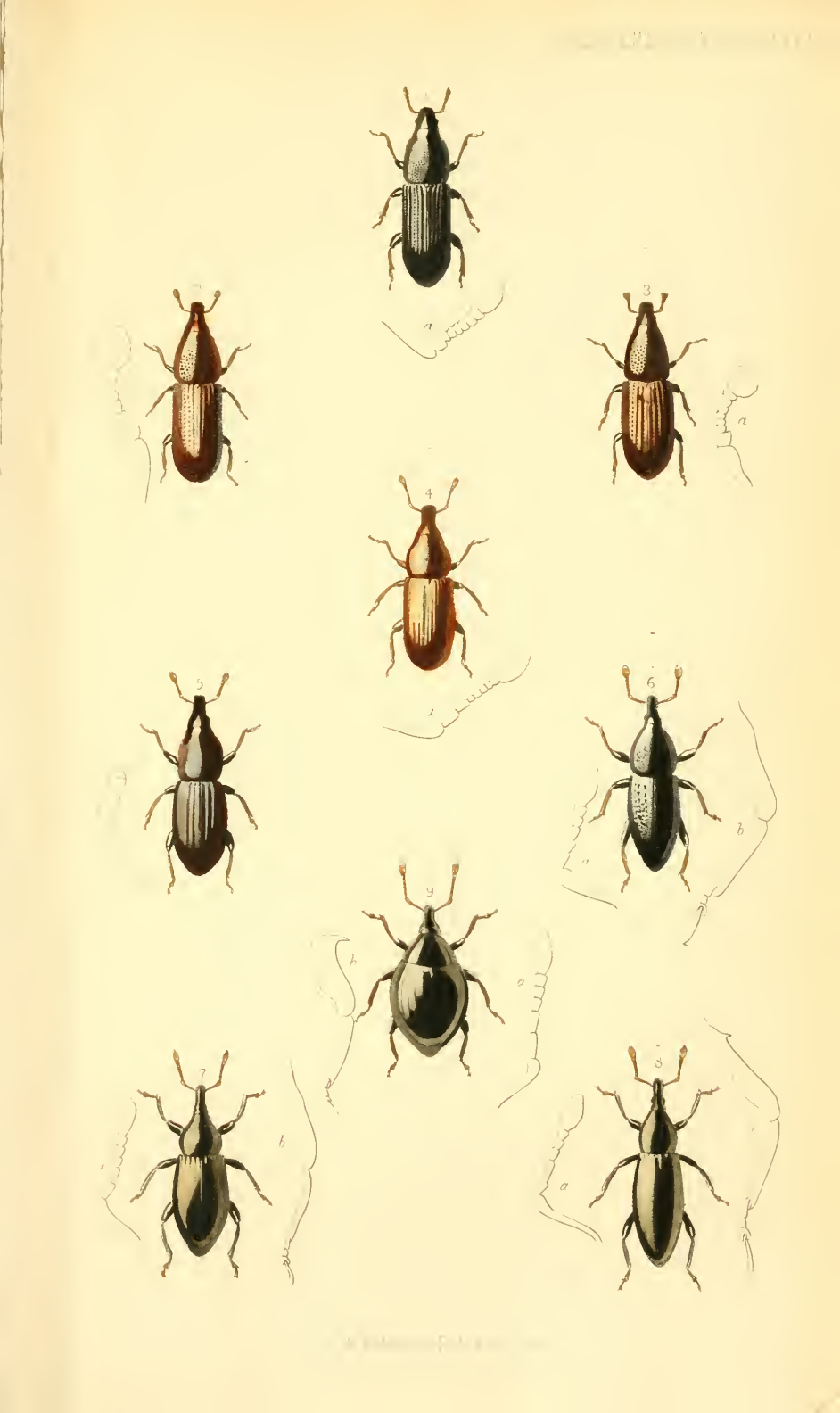

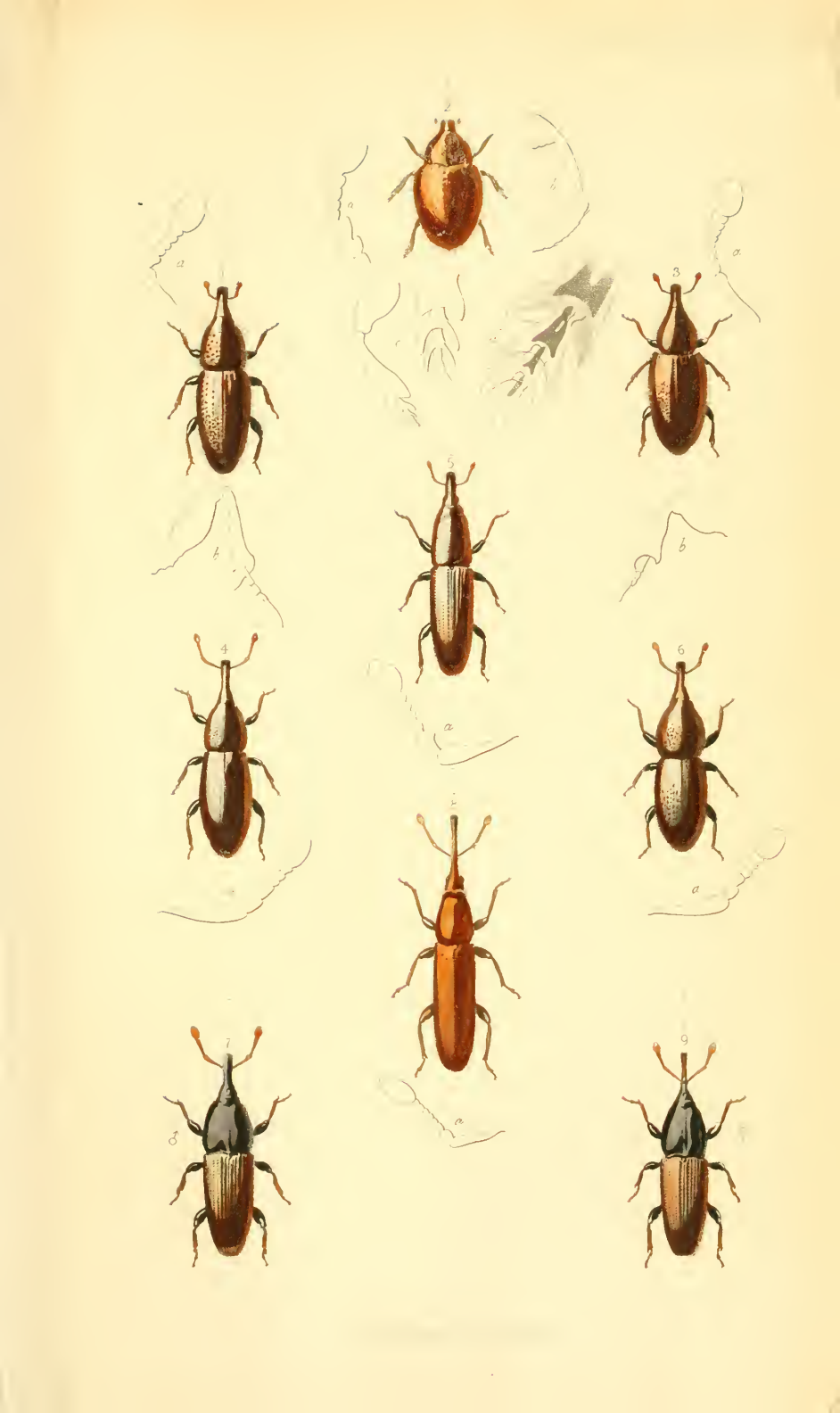

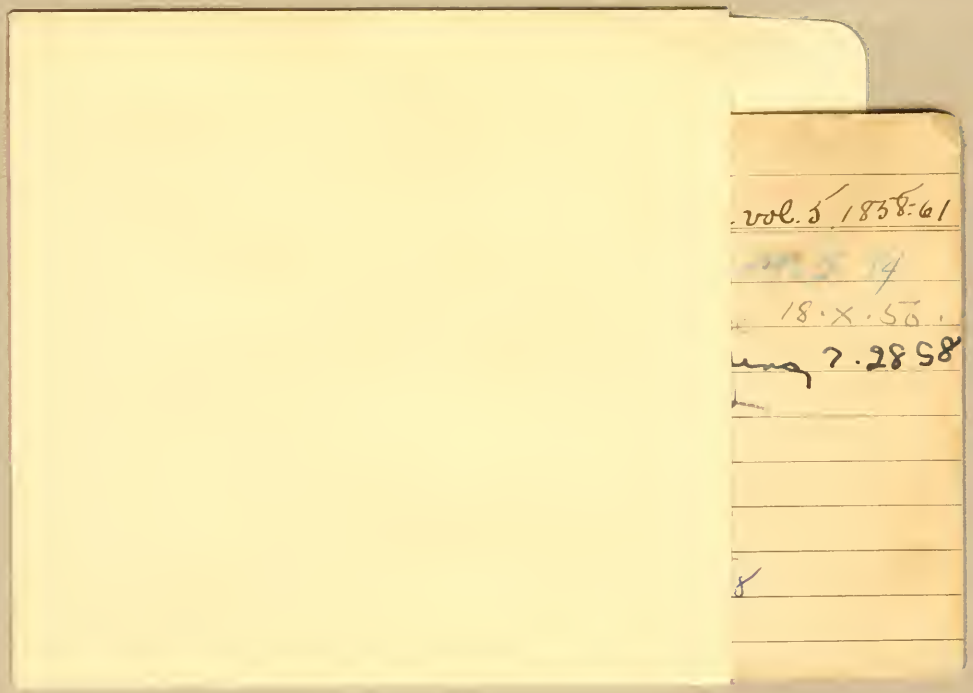

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